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ANNUAL CATALOGUE

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1905-1906

ONE HUNDRED AND ELEVENTH YEAR

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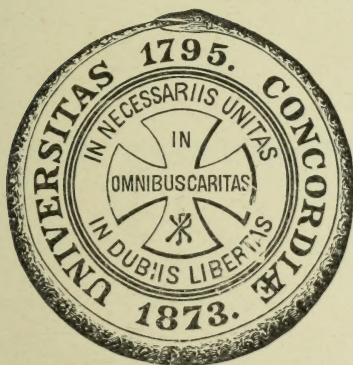
NEW YORK  
PRESS OF JOHN B. WATKINS COMPANY  
9-15 MURRAY STREET





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ANNUAL CATALOGUE  
OF  
UNION UNIVERSITY



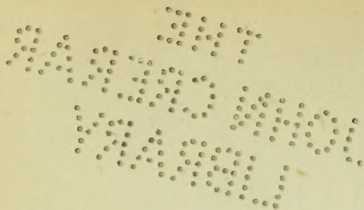
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1905-1906

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NEW YORK  
PRESS OF JOHN B. WATKINS COMPANY  
9-15 MURRAY STREET

R.A.W.





UNION UNIVERSITY

# COLLEGE CALENDAR FOR 1906

	S	M	T	W	T	F	S		S	M	T	W	T	F	S
<b>Jan.</b>	...	1	2	3	4	5	6	<b>July</b>	1	2	3	4	5	6	7
	7	8	9	10	11	12	13		8	9	10	11	12	13	14
	14	15	16	17	18	19	20		15	16	17	18	19	20	21
	21	22	23	24	25	26	27		22	23	24	25	26	27	28
	28	29	30	31	...	...	...		29	30	31	...	...	...	...
<b>Feb.</b>	...	...	...	...	...	...	...	<b>Aug.</b>	...	...	...	...	...	...	...
	...	...	...	...	1	2	3		...	...	...	1	2	3	4
	4	5	6	7	8	9	10		5	6	7	8	9	10	11
	11	12	13	14	15	16	17		12	13	14	15	16	17	18
	18	19	20	21	22	23	24		19	20	21	22	23	24	25
	25	26	27	28	...	...	...		26	27	28	29	30	31	...
<b>Mar.</b>	...	...	...	...	...	...	...	<b>Sept.</b>	...	...	...	...	...	...	1
	...	...	...	...	1	2	3		2	3	4	5	6	7	8
	4	5	6	7	8	9	10		9	10	11	12	13	14	15
	11	12	13	14	15	16	17		16	17	18	19	20	21	22
	18	19	20	21	22	23	24		23	24	25	26	27	28	29
	25	26	27	28	29	30	31		30	...	...	...	...	...	...
<b>Apr.</b>	...	...	...	...	...	...	...	<b>Oct.</b>	...	...	...	...	...	...	...
	...	...	...	...	...	...	...		...	1	2	3	4	5	6
	1	2	3	4	5	6	7		7	8	9	10	11	12	13
	8	9	10	11	12	13	14		14	15	16	17	18	19	20
	15	16	17	18	19	20	21		21	22	23	24	25	26	27
	22	23	24	25	26	27	28		28	29	30	31	...	...	...
	29	30	...	...	...	...	...		...	...	...	...	...	...	...
<b>May</b>	...	...	...	...	...	...	...	<b>Nov.</b>	...	...	...	...	1	2	3
	...	...	1	2	3	4	5		...	...	...	...	1	2	3
	...	...	...	...	...	...	...		4	5	6	7	8	9	10
	6	7	8	9	10	11	12		11	12	13	14	15	16	17
	13	14	15	16	17	18	19		18	19	20	21	22	23	24
	20	21	22	23	24	25	26		25	26	27	28	29	30	...
	27	28	29	30	31	...	...		...	...	...	...	...	...	...
<b>June</b>	...	...	...	...	...	...	...	<b>Dec.</b>	...	...	...	...	...	...	1
	...	...	...	...	...	1	2		...	...	...	...	...	...	...
	...	...	...	...	...	...	...		2	3	4	5	6	7	8
	3	4	5	6	7	8	9		9	10	11	12	13	14	15
	10	11	12	13	14	15	16		16	17	18	19	20	21	22
	17	18	19	20	21	22	23		23	24	25	26	27	28	29
	24	25	26	27	28	29	30		30	31	...	...	...	...	...

Figures in heavy type indicate days on which Union College is in session.



UW 320 H  
1905/06 - 1907/08

## UNIVERSITY CALENDAR

- 1906.
- 2 Jan. Registration Day for Students, Winter term,  
Union College.
- 3 Jan. Winter term of Medical College resumes.
- 3 Jan. Recitations begin, Union College.
- 25 Jan. Day of Prayer for Colleges.
- 26 Jan. First semester of Law School ends.
- 30 Jan. Second semester of Law School begins.
- 17 Feb. Allison-Foote Prize Debate between the Literary  
Societies.
- 22 Feb. Washington's Birthday.
- 3 March Examination for conditioned students.
- 23 March Winter term of Union College ends.
- 26 March Registration Day for Students, Spring term,  
Union College.
- 27 March Recitations begin, Union College.
- 10 April Commencement of the College of Pharmacy.
- 13-16 April Easter Recess, Union College.
- 21 April Selection of Junior and Sophomore prize orators.
- 1 May Commencement of the Medical College.
- 5 May Examination for conditioned students.
- 15 May Date for presentation of prize essays.
- 30 May Memorial Day.
- 31 May Commencement of Law School.
- 1 June Senior Examinations end.
- 10 June Sunday. Baccalaureate Sermon, Union College.
- 11 June Prize Contest in Extemporaneous Speaking, and  
Prize Oratory of Juniors and Sophomores.
- 12 June Meeting of Trustees, Phi Beta Kappa, Sigma Xi,  
Alumni.
- 13 June Commencement of Union College, the second  
Wednesday in June, President's reception.

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**University Calendar—Continued**

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- 1906.
- 14-15 June Entrance examinations, Union College.
- 17 Sept. Registration Day for Freshmen, Union College.
- 19 Sept. Registration Day for Students other than Freshmen, Union College. Entrance Examinations, Union College.
- 20 Sept. First Chapel Exercises and Recitations, Entrance Examinations concluded.
- 21 Sept. Freshman Recitations begin.
- 22 Sept. Examination for conditioned students.
- 25 Sept. Registration Day, Law School.
- 25 Sept. Winter term of Medical College begins.
- 26 Sept. Law School begins.
- 1 Oct. The College of Pharmacy begins.
- 6 Nov. Election Day.
- 29 Nov. Thanksgiving Day. Recess four days.
- 8 Dec. Examination for conditional students.
- 22 Dec. Fall term of Union College ends.
- 1907.
- 2 Jan. Registration Day for Students, Winter term, Union College.
- 3 Jan. Winter term of Medical College resumes.
- 3 Jan. Recitations begin, Union College.
- 3 Jan. Winter term of College of Pharmacy resumes.
- 24 Jan. Day of Prayer for Colleges.
- 16 Feb. Allison-Foote Prize Debate between the Literary Societies.
- 22 Feb. Washington's Birthday.
- 2 March Examination for conditioned students.
- 22 March Winter term of Union College ends.
- 25 March Registration Day for Students, Spring term, Union College.

**University Calendar—Concluded**

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26 March	Recitations begin, Union College.
9 April	Commencement of the College of Pharmacy.
7 May	Commencement of the Medical College.
9 June	Sunday. Baccalaureate Sermon, Union College.
10 June	Prize Contest in Extemporaneous Speaking and Prize Oratory of Juniors and Sophomores.
11 June	Meeting of Trustees, Phi Beta Kappa, Sigma Xi, Alumni.
12 June	Commencement of Union College, the second Wednesday in June. President's reception.
13, 14 June	Entrance Examinations, Union College.



UNION UNIVERSITY

UNION COLLEGE, Schenectady,  
N. Y.  
Founded 1795

Academic Department

Classical Course

Latin Scientific Course

Scientific Course

Engineering School

General Engineering Course

Sanitary Engineering Course

Electrical Engineering Course

MEDICAL COLLEGE, Albany, N. Y., Founded 1838

LAW SCHOOL, Albany, N. Y., Founded 1851

DUDLEY OBSERVATORY, Albany, N. Y., Founded 1852

COLLEGE OF PHARMACY, Albany, N. Y., Founded 1881

## UNION UNIVERSITY

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Union University embraces the following institutions:

UNION COLLEGE

ALBANY MEDICAL COLLEGE

ALBANY LAW SCHOOL

DUDLEY OBSERVATORY

ALBANY COLLEGE OF PHARMACY

Union College acquired by its charter, granted in 1795, full University powers, but the creation of graduate institutions at Schenectady was not found practicable. Schools of Law and Medicine and also an Astronomical Observatory have long existed at Albany, only a few miles distant. The arrangement naturally suggested by these circumstances was, that the Professional Schools and the Observatory at Albany should be united with Union College, under the Charter and Board of Trustees of the latter. This was accordingly effected by the incorporation of Union University in 1873. The Albany College of Pharmacy was created by the Board of Governors, June 21, 1881, and incorporated as a Department of the University, August 21 of the same year.

The President of Union College and permanent Chancellor of Union University has the oversight of the University, each of the institutions having its resident Dean. The Dean of Union College acts in the place of the President in his absence, and also assists him in matters delegated to him by the President. The University Board of Governors is composed of permanent trustees of Union College and of representatives of each of the other institutions embraced in Union University.

**OFFICERS OF THE UNIVERSITY****Chancellor**

ANDREW V. V. RAYMOND, D. D., LL. D.

**Honorary Chancellor, 1905**

THE REV. CHARLES CUTHBERT HALL, D. D.  
President of Union Theological Seminary.

**Board of Governors****PRESIDENT**

SIMON W. ROSENDALE, Albany, N. Y.

**SECRETARY**

AMASA J. PARKER, LL. D., Albany, N. Y.

**Union College**

ANDREW V. V. RAYMOND, D. D., LL. D. . . . . Schenectady, N. Y.  
 SILAS B. BROWNELL, LL. D. . . . . New York City.  
 WILLIAM IRVIN, D. D. . . . . Oyster Bay, N. Y.  
 EDWARD WINSLOW PAIGE, LL. D. . . . . New York City.  
 JOHN H. STARIN . . . . . New York City.  
 JOHN A. DEREMER, A. M. . . . . Schenectady, N. Y.  
 CLARK BROOKS, A. M. . . . . New York City.  
 GEORGE ALEXANDER, D. D. . . . . New York City.  
 WARNER MILLER, LL. D. . . . . Herkimer, N. Y.  
 NICHOLAS V. V. FRANCHOT, A. M. . . . . Olean, N. Y.  
 GEORGE F. SEWARD, LL. D. . . . . New York City.

**Albany Medical College**

SIMON W. ROSENDALE . . . . . Albany, N. Y.  
 ALDEN CHESTER . . . . . Albany, N. Y.



**Albany Law School**

AMASA J. PARKER, LL. D.....	Albany, N. Y.
J. NEWTON FIERO, LL. D.....	Albany, N. Y.

**Dudley Observatory**

SAMUEL B. WARD, M. D., PH. D.....	Albany, N. Y.
BENJAMIN WALWORTH ARNOLD .....	Albany, N. Y.

**Albany College of Pharmacy**

WILLIS G. TUCKER, M. D., PH. D., F. C. S.....	Albany, N. Y.
CHARLES NEWMAN .....	Albany, N. Y.

## UNIVERSITY FACULTY

---

ANDREW V. V. RAYMOND, D. D., LL. D.

Chancellor.

BENJAMIN H. RIPTON, PH. D., LL. D.

Dean of Union College and Professor of History and Sociology

SAMUEL B. WARD, M. D., PH. D.

Dean of the Medical Faculty and Professor of Theory and Practice of Medicine, and of Hygiene

J. NEWTON FIERO, LL. D.

Dean of the Law School and Professor of Procedure, Equity and Torts

LEWIS BOSS, A. M., LL. D.

Director of the Dudley Observatory

WILLIS G. TUCKER, M. D., PH. D., F. C. S.

Dean of the College of Pharmacy, Registrar of the Medical College, and Professor of Chemistry and Toxicology

WILLIAM WELLS, PH. D., LL. D.

Professor Emeritus of Modern Languages and Literature, and Lecturer on Current History

JOHN M. BIGELOW, M. D., PH. D.

Professor Emeritus of Materia Medica, Therapeutics and Diseases of the Throat and Nose

ALBERT VANDER VEER, M. D., PH. D.

Professor of Surgery

JAMES P. BOYD, M. D.

Professor of Obstetrics, Gynecology and Diseases of Children

WILLIAM HAILES, M. D.

Anthony Professor of Pathological Anatomy, Histology, and  
Fractures and Dislocations

CYRUS S. MERRILL, M. D.

Professor of Ophthalmology and Otology

SIDNEY G. ASHMORE, A. M., L. H. D.

Professor of the Latin Language and Literature.

FREDERIC C. CURTIS, M. D.

Professor of Dermatology

ALFRED B. HUESTED, M. D., PH. G.

Professor of Botany and Materia Medica

GUSTAVUS MICHAELIS, PH. G.

Professor Emeritus of Pharmacy

HENRY HUN, M. D.

Professor of Diseases of the Nervous System

SAMUEL R. MORROW, M. D.

Professor of Practice of Surgery and of Orthopedic Surgery

THOMAS W. WRIGHT, A. M., PH. D.

Professor Emeritus of Mathematics.

FRANK S. HOFFMAN, A. M., PH. D.

Professor of Mental and Moral Philosophy



*Union University*

OLIN H. LANDRETH, A. M., C. E., Sc. D.  
Professor of Civil Engineering

HERMAN CAMP GORDINIER, M. D.  
Professor of Physiology

WENDELL LAMOROUX, A. M.  
Librarian Emeritus of Union College

JAMES H. STOLLER, A. M., PH. D.  
Professor of Biology and Geology

EDWARD EVERETT HALE, JR., PH. D.  
Professor of English

LEWIS R. PARKER  
Professor of the Law of Bailments, Bills and Notes.

HOWARD VAN RENSSELAER, M. D.  
Professor of Materia Medica and Therapeutics, and Adjunct  
Professor of Theory and Practice of Medicine

JOSEPH DAVIS CRAIG, M. D.  
Professor of Anatomy, and Curator of the Museum

WILLIS GOSS MACDONALD, M. D.  
Professor of Abdominal and Clinical Surgery

FLETCHER W. BATTERSHALL  
Professor of Elementary Law and Domestic Relations

CHARLES P. STEINMETZ, A. M., PH. D.  
Professor of Electrical Engineering

JOHN I. BENNETT, A. B.

Professor of the Greek Language and Literature

HOWARD OPDYKE, A. B.

Professor of Physics

RICHARD MILLS PEARCE, M. D.

Professor of Pathology and Bacteriology

EDWARD ELLERY, A. M., PH. D.

Professor of Chemistry

FRANK WHITE

Professor of the Law of Corporations

GEORGE LAWYER

Professor of the Law of Contracts

FRANK B. GILBERT

Professor of the Law of Real Property

HON. ALTON B. PARKER, LL. D.

Lecturer on Development of the Law

HON. IRVING G. VANN, LL. D.

Lecturer on the Law of Insurance

HON. D. CADY HERRICK

Lecturer on Municipal Corporations

HON. ALDEN CHESTER

Lecturer on the Federal Judicial System

HON. WALTER B. WARD

Lecturer on Copyrights and Trade Marks

STEPHEN B. GRISWOLD

Lecturer on Books and Their Uses

ALVAH S. NEWCOMB

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Adjunct Professor of Modern Languages

FRANK COE BARNES, A. M., PH. D.

Adjunct Professor of Modern Languages

SPENCER LYMAN DAWES, M. D.

Adjunct Professor of Materia Medica.

HOLMES CONDUCT JACKSON, PH. D.

Adjunct Professor of Physiological Chemistry

GARRET VANDER VEER DILLENBACK, PH. G.

Associate Professor of Pharmacy

ANDREW MACFARLANE, M. D.

Clinical Professor of Physical Diagnosis and Medical Jurisprudence, and Law School Lecturer on  
Medical Jurisprudence

HERMAN BENDELL, M. D.

Clinical Professor of Otology

ARTHUR GUERNSEY ROOT, M. D.

Clinical Professor of Diseases of the Throat and Nose

LEO HAENDELL NEUMAN, M. D.

Clinical Professor of the Theory and Practice of Medicine and  
Gastro-Enteric Diseases



JESSE M. MOSHER, M. D.

Clinical Professor of Insanity, Neurology and Electro-Therapeutics

HARRY JUDSON LIPES, M. D.

Clinical Professor of Obstetrics

FRANK B. WILLIAMS, C. E., M. S., PH. D.

Assistant Professor of Engineering and Mathematics.

ELMER E. F. CREIGHTON, B. S., E. E.

Assistant Professor of Electrical Engineering

HORACE GRANT McKEAN, A. B.

Assistant Professor of Public Speaking and Rhetoric

ARTHUR JAY ROY, C. E., A. M.

Assistant in Dudley Observatory

ARTHUR W. ELTING, M. D.

Lecturer on Surgical Pathology

WILLIAM OLIN STILLMAN, M. D.

Lecturer on the History of Medicine

HAMILTON W. MABIE, LL. D.

Lecturer on English Literature

GEORGE EMORY LOCHNER, M. D.

Lecturer on Gynecology

THEODORE JAMES BRADLEY, B. S., PH. G.

Lecturer on Inorganic Chemistry and Instructor in Chemistry and Mathematics

ARTHUR TURNER LAIRD, M. D.

Lecturer on Clinical Microscopy and Instructor in Microscopy

CHARLES HENRY MOORE, M. D.

Lecturer on Ophthalmology and Otology

THOMAS WILLIAMS JENKINS, M. D.

Instructor in Microscopy, Materia Medica and Pharmacognosy

WILFRED SYLVESTER HALE, M. D.

Lecturer and Demonstrator in Anatomy and Assistant Curator  
of the Museum

WILLIAM B. VARNUM, A. B.

Assistant in Dudley Observatory

CLEMENT F. THEISEN, M. D.

Lecturer on Diseases of the Throat and Nose

CHARLES HARPER RICHARDSON, M. D.

Lecturer on Minor Surgery

ARTHUR SAUTTER, M. D.

Lecturer on Dermatology and Genito-Urinary Diseases

HENRY LARNED KEITH SHAW, M. D.

Lecturer on Diseases of Children

HERBERT DODGE PEASE, M. D.

Lecturer on Antitoxins and Immunity

ALVAH HARRY TRAVER, M. D.

Instructor in Surgery

EDGAR ROSCOE STILLMAN, M. D.

Instructor in Physiology

EDGAR ALBERT VANDER VEER, M. D.

Lecturer on Surgery

EDWIN MACDONALD STANTON, M. D.

Lecturer on Histology

JOHN ALBERTSON SAMPSON, M. D.

Lecturer on Gynecology

HERBERT L. TOWNE, A. B., M. D.

Instructor in Physical Culture

EDWARD WATERBURY BECKER, M. D.

Instructor in Physiology

HARRY WARDELL CAREY, M. D.

Instructor in Surgical Pathology

EDWIN CUNNINGHAM HUTMAN, PH. G.

Director of Pharmaceutical Laboratory

C. F. F. GARIS, PH. B.

Instructor in Mathematics

LEO FRANK ADT, M. D.

Instructor in Ophthalmology

EDWARD GERALD GRIFFIN, M. D.

Instructor in Theory and Practice of Medicine

JAMES FRANCIS ROONEY, M. D.

Instructor in Theory and Practice of Medicine

JAMES WESLEY WILTSE, M. D.

Instructor in Dermatology and Genito-Urinary Diseases

HOWARD EATON LOMAX, M. D.

Instructor in Anatomy and Assistant Demonstrator of Anatomy

CHARLES KNICKERBACKER WINNE, JR., M. D.

Instructor in Bacteriology, Materia Medica and Therapeutics.

GEORGE GUSTAVE LEMPE, M. D.

Instructor in Anatomy

EDWIN FORREST SIBLEY, M. D.

Instructor in Surgical Pathology

SAMUEL E. WEBER, B. S. in M. E.

Instructor in Civil Engineering

JOHN W. HUGHES, B. S. in C. E.

Instructor in Civil Engineering

OLIN J. FERGUSON, B. S.

Instructor in Electrical Engineering

WALTER M. CURTIS, B. S.

Instructor in Mechanical Engineering

CHARLES H. McCULLOCH, B. E.

Instructor in Civil Engineering

SILAS LORENZO FILKINS, M. D.

Instructor in Anatomy and Prosector of Anatomy

JAMES EMMETT HUESTED

Instructor in Materia Medica and Pharmacognosy

LA SALLE ARCHAMBAULT, M. D.

Instructor in Neurology



LEON KAHN BAEDAUT, M. D.

Instructor in Histology

HAROLD EUGENE ROBERTSON, M. D.

Instructor in Bacteriology and Pathology

GEORGE EVERETT BEILBY, M. D.

Instructor in Histology

ERNEST VICTOR FREDERICK, L. R. C., P. (Lond.)

Instructor in Physiology and Clinical Microscopy

JOSEPH ALOYSIUS LANAHAN, M. D.

Instructor in Dermatology

HARRY RAYMOND, A. B.

Assistant in Dudley Observatory

WILLIAM ATWOOD HARTSIN

Instructor in Physics

DAVID CHARLES CALDWELL, A. B.

Assistant in Chemistry

## STUDENTS OF UNION COLLEGE

## Abbreviations

*c*, A. B. course; *ls*, Ph. B. course; *s*, B. S. course; *e*, B. E. course in General Engineering; *se*, B. E. course in Sanitary Engineering; *ee*, B. E. course in Electrical Engineering; N. S., North Section; M. S., Middle Section; S. S., South Section; N. C., North College; S. C., South College.

## Seniors, Class of 1906

<i>ee</i>	LEROY BEERS.....	<i>Schenectady</i> ....	28 Eagle St.
<i>s</i>	WILLIAM LEROY BROOKS.....	<i>Albany</i> .....	A Δ Φ House
<i>e</i>	MELVIN DAVID CASLER.....	<i>Johnstown</i> .....	1 S. S. S. C.
<i>ee</i>	ARNOLD G. CHAPMAN.....	<i>Guilderland</i> .....	Ψ T House
<i>c</i>	PHILIP LUKE CLASSEN.....	<i>Albany</i> .....	Ψ T House
<i>e</i>	EDGAR STONE CLOSSON.....	<i>Gloversville</i> .....	Δ T House
<i>c</i>	HARRY COOK .....	<i>Albany</i> .....	Φ Γ Δ House
<i>ee</i>	ERNEST MONTGOMERY DANN.....	<i>Downsville</i> ....	Φ Δ Θ House
<i>ee</i>	CLARENCE R. DARBY.....	<i>Rochester</i> ....	802 State St.
<i>s</i>	CHARLES STEVENS DWIGHT.....	<i>Columbia, S. C.</i>	K A Lodge
<i>e</i>	EDGAR W. EARLE.....	<i>Lancaster</i> .....	9 S. S. S. C.
<i>c</i>	PAUL JONATHAN HAGAR.....	<i>Plattsburgh</i> ....	B Θ II House
<i>e</i>	HARRY NELSON HAIGHT.....	<i>Fishkill</i> .....	Φ Δ Θ House
<i>e</i>	GEORGE FRANCIS HALL.....	<i>Albany</i> .....	Φ Δ Θ House
<i>ls</i>	GEORGE WALTER HITT.....	<i>Unadilla</i> .....	Δ T House
<i>e</i>	LESLIE GILBERT HOLLERAN.....	<i>Hadley</i> .....	Δ T House
<i>ee</i>	CLAUDE KINNE HUSTON.....	<i>Selma, Ala.</i>	332 Summit Ave.

<i>ls</i>	DANIEL FERGUSON IMRIE.....	<i>Caldwell</i> .....	Δ Φ House
<i>e</i>	ALFRED J. KAUFMAN.....	<i>Rensselaer</i> .....	57 Glen St.
<i>e</i>	WARNER KING.....	<i>Brooklyn</i> .....	A Δ Φ House
<i>s</i>	LEON RAY LEWIS.....	<i>Gilboa</i> .....	5 N. S. N. C.
<i>s</i>	HERRICK MCCLENTHEN.....	<i>Jefferson</i> .....	2 N. S. N. C.
<i>ls</i>	PAUL ALONZO MEAD.....	<i>Schenectady</i> .....	X Ψ Lodge
<i>ls</i>	FLOYD LESLIE MILLER.....	<i>Fort Plain</i> .....	Δ Φ House
<i>ee</i>	THIAGO VIEIRA MONTEIRO.....	<i>Brazil</i> .....	514 Union St.
<i>ee</i>	JOHN LESLIE MOON.....	<i>Cooperstown</i> .....	Φ Δ Θ House
<i>ee</i>	GEORGE CHAPMAN NEWBURY.....	<i>Goshen</i> .....	Ψ T House
<i>e</i>	WALTER ERNEST NUTT.....	<i>Cohoes</i> .....	9 S. S. S. C.
<i>e</i>	JOHN ALOYSIUS O'DONNELL.....	<i>Salem</i> .....	5 S. S. N. C.
<i>ee</i>	JOHN BRADBURY PEBBLES.....	<i>Petersburg, Va.</i>	Σ Φ Place
<i>ee</i>	LEIGHTON HARTWELL PEBBLES...	<i>Petersburg, Va.</i>	Σ Φ Place
<i>ee</i>	SAMUEL JOHNSON RAYMOND.....	<i>Buffalo</i> .....	A Δ Φ House
<i>c</i>	JOHN FAY PUTNAM.....	<i>Johnstown</i> .....	Δ T House
<i>c</i>	BYRON WILLIAM REED.....	<i>Olean</i> .....	Δ T House
<i>s</i>	LORENZO N. RIDER.....	<i>Bath</i> .....	X Ψ Lodge
<i>ee</i>	RAYMOND DERRICK SHERMAN....	<i>Melrose</i> .....	10 N. S. N. C.
<i>e</i>	WILLIAM EDMUND STONEY.....	<i>Pinopolis, S. C.</i>	K A Lodge
<i>e</i>	HARRY ADELBERT SYLVESTER.....	<i>Schenectady</i>	817 Locust Ave.
<i>s</i>	GEORGE ARTHUR VEDDER.....	<i>Schenectady</i> .....	X Ψ Lodge
<i>ee</i>	CARL OTTO VON DANNENBERG....	<i>Stapleton</i> .....	A Δ Φ House
<i>s</i>	CHARLES NEWMAN WALDRON....	<i>Detroit, Mich.</i>	A Δ Φ House
<i>ee</i>	JOHN GIBBON WEBB.....	<i>Summerville, S. C.</i>	M. S. N. C.
<i>ee</i>	NELSON PHILIP WEIER.....	<i>Lyons</i> .....	N. S. N. C.
<i>c</i>	WALTER FANSTONE WELLMAN...	<i>Schenectady</i> ...	922 State St.

ls MEADE LAFAYETTE ZIMMER.....*Gallupville*....B Θ II House  
Seniors—45.

### Juniors, Class of 1907

ee ANDREW ORDELL AVERY.....*Delanson* .....Delanson  
ls RAYMOND S. BENNETT.....*Schenevus*...14 N. S. N. C.  
ee HOWARD ELMER BISHOP.....*Sayre, Pa.*....Φ Δ Θ House  
s EARL CROUL BRADBEER.....*Detroit, Mich.*..A Δ Φ House  
e JAMES G. BRENNAN.....*Albany*.....Δ Φ House  
e HERVEY EDWIN BUTCHER.....*Oneida*.....Ψ T House  
e HERBERT EDWARD CANTWELL.....*St. Simons Island, Ga.*  
Φ Γ Δ House  
ee HUGH GARNETT DAVIS.....*Lynchburg, Va.*..Φ Γ Δ House  
ls JESSE ABRAM DEMEY.....*Sodus*.....Δ T House  
ee RICHARD SYLVESTER DILLON, JR..*Rensselaer* .....Rensselaer  
ee EDWARD JAMES FAIRBAIRN.....*Buffalo*.....A Δ Φ House  
ee NICHOLAS V. V. FRANCHOT, 2D..*Niagara Falls*...Σ Φ Place  
s HAROLD GARDINER.....*Hadley*.....A Δ Φ House  
ls FRED. GIRVIN.....*Schenectady*...708 Westover  
Ave.  
e EARL EWAN HARVEY.....*Schenectady*..316 Clinton St.  
s DUDLEY TOLL HILL.....*Schenectady*..1725 Union St.  
ee GORDON RUSSELL LANGLEY.....*Schenectady*...Douglas Road  
ls WILLARD ANDREW MCCLELLAN...*West Hebron*...A Δ Φ House  
e WALTER T. MCINTOSH.....*Buffalo*.....K A Lodge  
e BENJAMIN NOX MOOERS.....*Plattsburgh*.....Σ Φ Place  
ee FRANK LESLIE MOORE.....*French Mountain*.  
13 M. S. N. C.



e	FREDERICK WHITMAN NEWTON...	Buffalo.....	K A Lodge
ee	ALEXANDER JOSEPH NICHT, JR...	Auburn.....	330 Carrie St.
c	GEORGE BURTON NOBLE.....	Jonesville.....	X Ψ Lodge
ee	D. HENRY OSBORNE, 2D.....	Victor.....	M. S. S. C.
c	LEWIS STEWART PARSONS.....	Liberty.....	Δ T House
ee	RICHARD MILTON PYLES.....	Brazil.....	704 New Central Ave.
e	ROLLIN D. REED.....	Binghamton...	Φ Γ Δ House
es	RUBEM C. RODRIGUES.....	Brazil.....	P. O. Box 528
ee	EDWIN MATHIAS SECRIST.....	Swounville.....	M. S. N. C.
ee	RALPH WINNE STEARNS.....	South Berlin..	420 Crane St.
e	ALLBICH SANFORD TIEDEMAN....	Schenectady..	708 South Ave.
ee	PETER WILLOUGHBY TRAYNOR....	Owego.....	2 M. S. N. C.
ee	RALPH TRUMBULL.....	Johnstown .....	Δ Φ House
ee	MASON WILLIAM WADSWORTH..	Binghamton...	A Δ Φ House
e	PAUL WAIT.....	Fort Edward....	X Ψ Lodge
e	CHARLES RAY WATERS.....	Avoca.....	Φ Δ Θ House
ee	WILLIAM EARL WELLER.....	Schenectady..	614 Chapel St.
c	ALBERT HUNTLEY WHITE.....	Manchester, N. H.	12 S.S.S.C.
c	JOSEPH THATCHER WRIGHT.....	Pulaski.....	A Δ Φ House

Juniors—40.

### Sophomores, Class of 1908

e	JOHN L. BACON, JR.....	Elmira.....	Ψ T House
e	THOMAS SHERWOOD BAILEY.....	Burnt Hills...	B Θ II House
ls	HENRY WINNE BELL.....	Albany.....	K A Lodge
e	JAMES EDWARD BELL.....	Westmoreland..	Φ Δ Θ House

s	WILLIAM FRANCIS BELL.....	Delhi.....	M. S. N. C.
e	BRADFORD B. BINGHAM.....	Northampton, Mass..	47 Euclid Ave.
e	EMANUEL HERBERT BOCIAN.....	Albany.....	12 S. C. N. C.
e	JOSEPH CAPLAN .....	Albany .....	Albany
e	WALTER JOHN CLARK.....	Albany.....	118 Park Place
e	WILLARD D. COVEY.....	Lyon Falls.....	N. S. N. C.
s	WILLIS DAVID CURTISS.....	Sodus.....	Δ T House
ls	ARTHUR EDGAR DAVIES.....	Wales, Iowa..	140 Van Vranken Ave.
e	MICHAEL J. J. DWYER.....	Troy .....	Troy
e	JOHN BENJAMIN FLOWERS.....	Schenectady..	815 Locust Ave.
ls	CHESTER G. FULLERTON.....	Schenectady..	6 Chestnut St.
e	DAVID GRANT.....	Green Island..	Φ Γ Δ House
e	CARLOS GERST HAFLEY.....	Albany.....	Φ Δ Θ House
e	THOMAS EDWARD HANIGAN.....	Schenectady..	938 State St.
e	LEON C. HEILBRONNER.....	Schenectady..	238 Union St.
e	FERDINAND HELM .....	Saratoga.....	Δ Φ House
c	HIRAM THOMAS HILDRETH.....	Middleville...	A Δ Φ House
e	WILLIAM DUELTON HILDRETH....	Herkimer....	A Δ Φ House
e	LELAND SILAS HOFFMAN.....	St. Johnsville...	K A Lodge
e	HAROLD WARNER JEWELL.....	Schenectady..	12 Chestnut St.
ls	ARTHUR BEACH KING.....	Troy.....	Σ Φ Place
e	ALEXANDER DORN KLINE.....	Schenectady..	300 Parkwood Bly'd
e	ALBERT SOUTHARD KNIGHT.....	Round Lake...	B Θ Π House
e	FRANKLIN EUGENE KRUESI.....	Schenectady.....	Σ Φ Place
ls	EDWIN L. LA CROSSE.....	Schenectady..	109 Nott Terrace
e	ARTHUR LEWIS LA ROCHE.....	Binghamton.....	Ψ T House

e	ROBERT FULLER MACMULLEN.....	Schenectady..	519 Hamilton St.
e	AUGUSTINE MARX.....	Amsterdam....	9 S. S. N. C.
ls	WALTER SCOTT McNAB.....	Schenectady..	13 Romeyn St.
e	FREDERICK HENRY MEEKER.....	Unadilla.....	12 M. S. N. C.
c	HERMAN LEWIS MEYER.....	Green Island..	Green Island
s	JAMES P. MINAHAN.....	Schenectady..	706 South St.
e	HAROLD RANSOM MOORE* .....	Ogdensburg...	Φ Δ Θ House
e	ARBA ROMANS MORSE.....	Sidney Centre...	M. S. S. C.
e	CHARLES FRANKLIN MULROONEY..	Albany.....	237 Park Place
e	JOHN FREDERICK NASH.....	Plattsburg...	13 S. S. N. C.
s	D. L. PALMER.....	Masonville....	15 M. S. S. C.
e	LEVI PARSONS.....	Gloversville....	K A Lodge
e	FREDERICK ROYAL PECK.....	Deansboro....	Φ Δ Θ House
e	EDWARD J. PENROSE.....	Cohoes.....	8 S. S. N. C.
ls	CLARENCE HENRY POWELL.....	Cairo.....	532 Liberty St.
e	J. STANLEY PRESTON.....	Sharon Springs.	3 M. S. N. C.
c	ANDREW VAN VRANKEN RAY- MOND, JR.....	Schenectady..	A Δ Φ House
e	EDWIN HAZELETT ROBINSON.....	Watervliet .....	Watervliet
s	THEODORE DE J. DE SABLA, JR....	New York City	A Δ Φ House
e	RAYMOND O. SHELLEY.....	Albany.....	Ψ Υ House
c	PHILIP FOSTER SHUTLER.....	Watertown....	Φ Δ Θ House
e	RAYMOND EDWIN SNOW.....	Holyoke, Mass...	Δ Υ House
e	FRANK R. STEVENS.....	Albany.....	Ψ Υ House
c	ROSS WILLIAMS TIFFANY.....	Schenectady..	131 Furman St.
e	HARRY L. TRUMAN.....	Flemingsville..	Φ Δ Θ House
e	WAYNE A. VANDEGRIFT.....	Newport News, Va.	5 M. S. N. C.

\*Deceased.

e	CARL H. VOGT.....	Buffalo.....	Φ Δ Θ House
e	LOUIS WACHTEL.....	Gloversville.....	Δ Φ House
c	MARK SKINNER WATSON.....	Plattsburgh.....	Σ Φ Place
ls	MARTIN HENRY WEYRAUCH.....	Liberty.....	Δ T Lodge
e	GEORGE WILLIAM WRIGHT.....	Ogdensburg....	Φ Γ Δ House

Sophomores—61.

### Freshmen, Class of 1909

e	FLOYD ELMER ALLEN.....	Elmira.....	9 N. S. N. C.
e	FRANK COPLEY ARMSTRONG.....	Ballston Spa..	Ballston Spa
c	HOWARD B. BARTHOLOMEW.....	Cobleskill....	705 South Ave.
e	GLEN E. BATES.....	Big Flats..	147 Nott Terrace
e	STANLEY C. BAYLESS.....	Binghamton....	Ψ T House
e	THOMAS BERNARD BERGAN.....	Auburn.....	4 N. S. N. C.
e	WILLIAM WALDO BROWN.....	Brooklyn....	14 M. S. S. C.
e	FRANK JOHN BRUCKER.....	Rensselaer...14	Romeyn St.
e	ROBERT L. BRUNET.....	Petersburg, Va..	Σ Φ Place
e	CLARENCE E. BURLEIGH.....	Plattsburg....	10 S. S. N. C.
e	FRANCIS WILLIAM BURLEIGH....	Plattsburg....	10 S. S. N. C.
ls	JAMES BRADIN CHAPMAN.....	Broadalbin....	Δ Φ House
e	FRANCIS TEMPLE CHASE.....	Utica.....	15 N. S. N. C.
s	ADELBERT GARRY CLARK.....	Elmira.....	Ψ T House
e	PHILIP HATHAWAY CLARK, JR....	Kingston.....	A Δ Φ House
e	WILLIAM FRANCIS COLLINS.....	Petersburg, Va..	125 Barrett St.
e	WINFRED MACBAIN CORBIN.....	Binghamton....	Σ Φ Place
e	WENDELL JOSEPH CURTIS, JR....	Rochester.....	X Ψ Lodge



- e ALEXANDER DOUGLAS.....*Gloversville*..630 Liberty St.
- ls C. ROSCOE FAILING.....*Palatine Bridge*.8 M. S. S. C.
- s JOHN WILLIAM FAUST.....*Schenectady*.....19 Jay St.
- e RAYMOND J. FINCH.....*Alpine*.....6 N. S. N. C.
- e LEON BURHAUS FOOTE.....*Whitehall*.....Φ Γ Δ House
- e ERNEST JOHNSON FULLER.....*Warwick*.....K A Lodge
- e HARRY BURTON FURNSIDE.....*Schenectady*...936 State St.
- e SEAGER BLIGH GEORGE.....*Arkville*.....517 State St.
- e GUSTAV JACOB GONSER.....*Elmira*...315 Seward Place
- s DOANE SINCLAIR GUARDENIER...*East Springfield*,Φ Δ Θ House
- s WALTER G. HALE.....*Putnam*,  
140 Van Vranken Ave.
- ls JOHNSON POTTER HALLENBECK..*Hoffmans*.....Φ Γ Δ House
- s HARRY D. HANFORD.....*Unadilla*.....10 M. S. N. C.
- e EDWARD EVERETT HARKNESS...*Harkness*.....13 M. S. S. C.
- e SEWARD DANIEL HENDRICKS...*Sodus*.....16 M. S. N. C.
- e CALVIN C. HOLMES.....*Albany*.....Albany
- e JARED SHEPARD HORTON.....*Albany*.....Δ Φ House
- e FRANK EVERETT HUNTINGTON...*Keuka*...N. C. Bell Room
- e RAYMOND M. JOLLEY.....*South Bethlehem*..7 M.S.S.C.
- s JOHN DAVIS KELLOGG.....*Amsterdam*...A Δ Φ House
- e ANDREW VINCENT KELLY.....*Albany*.....Albany
- e EMIL KIESSLING.....*New York City*,3 M. S. N. C.
- e HENRY EDWARD LEWIS.....*Ballston Spa*..Ballston Spa
- e WILLIAM FRANKLIN LOW, JR...*Boston, Mass.*...Σ Φ Place
- e ROBERT ELMER MACNAMARA...*Brooklyn*.....Δ Τ House
- s LOUIS FRANKLIN MAUGHAM...*Tenafly, N. J.*...Φ Δ Θ House
- c ROY HAMILTON MCCORMACK...*Delmar*.....1 Second St.
- e JOHN JOSEPH MCCORMICK, JR...*Troy*.....Δ Τ House

c	JAMES RAY MCECKRON.....	Schuylerville....	Troy, 268 Pawling Ave.
e	CROMWELL MCINTOSH.....	Buffalo.....	K A Lodge
e	CHARLES LAWRENCE MEAD.....	Sault Sainte Marie, Mich.	A Δ Φ House
s	HERBERT HECTOR MERRILL.....	Schenectady.....	X Ψ Lodge
c	RALPH STETSON MERRILL.....	Gloversville...	512 State St.
ls	WARD WINTHROP MILLIAS.....	Castleton-on-Hudson.....	1 Second St.
s	HERBERT MINKIN.....	Albany....	131 Hamilton St.
s	CHESTER MOORE.....	Horseheads....	6 N. S. N. C.
e	CHARLES MORRIS.....	Auburn.....	3 N. S. N. C.
c	ELMER WALLACE K. MOULD....	Green Island..	124 Front St.
e	WILLIAM B. NEILSON, JR.....	Mechanicville....	Δ Φ House
e	J. ELLIOTT PARRY.....	Glens Falls.....	K A Lodge
e	HOWARD SYLVESTER PARSONS....	Albany.....	Albany, 516 Madison Ave.
ls	LEO B. PEARSALL.....	Sodus.....	Δ T House
s	JONATHAN PEARSON.....	Hudson.....	713 Union St.
e	LEO H. PERRY.....	Herkimer.....	9 M. S. S. C.
e	FRED WILBUR PETTIT.....	Avoca.....	Φ Δ Θ House
e	CEDRIC POTTER.....	Omaha, Neb....	X Ψ Lodge
c	ALONZO ALDEN PRATT.....	Albany.....	Δ T House
s	CHESTER LELAND RANKIN.....	Schenectady..	1202 State St.
s	DANIEL TOBIAS READ.....	Monck's Corner, S. C.	B Θ Π House
e	HOMER C. RICE.....	Scranton, Pa....	X Ψ Lodge
s	JESSE ABBOTT RICKARD.....	Schenectady...	512 State St.
c	GEORGE W. ROOSA.....	Buffalo.....	Δ T House
ls	PERCIVAL WILLARD ROWE.....	Valatie....	319 Seward Place
e	ROSCOE HALL SAMMONS.....	Sammonsville....	Δ Φ House
e	HARRY A. SCHAUPP.....	Albany.....	Ψ T House

s	JOHN LESLIE SCHOOLCRAFT.....	Schenectady..15	Washington Ave.
e	HERBERT DAVIS SCHUTT.....	Schenectady.347	Summit Ave
e	PIERRE J. SIMKINS.....	Amsterdam....11	S. S. S. C.
e	HAROLD ERNEST STARBUCK.....	Gouverneur...B	Θ Π House
e	BURR MANLOW STARK.....	Gloversville...5	M. S. N. C.
e	FRANK M. STEWART.....	Binghamton....Ψ	Υ House
e	ARTHUR J. STREIBERT.....	Albany.....Δ	Υ House
e	JOHN BENNETT TALLMAN.....	Brooklyn....207	Park Ave.
e	RALPH HENRY TAPSCOTT.....	Brooklyn....A	Δ Φ House
e	WILLIAM F. TAYLOR.....	Amsterdam.37	Wendell Ave.
e	DANIEL ROY THORNTON.....	Copenhagen..13	N. S. N. C.
ls	ALVIN URY.....	Schenectady...143½	Barrett St.
ls	RALPH J. URY.....	Schenectady...143½	Barrett St.
e	JOHN EDWARD VANDERBOSCH.....	Auburn.....13	N. S. N. C.
c	CARL WACHTER.....	Green Island..124	Front St.
s	OTTO JEAN WALRATH.....	Gloversville..630	Liberty St.
e	J. LESLIE WALTON.....	Schenectady...947	State St.
s	HERBERT A. WASHINGTON.....	Schenectady...18	University Place
c	JAMES BELL WELLES.....	Geneseo.....Δ	Φ House
s	JOHN HENRY YATES.....	Schenectady..126	Park Ave.

Freshmen—93.

### Irregular Students

(08 e)	LEWIS CORTRIGHT BENNETT.	Chicago, Ill...A	Δ Φ House
(07 ee)	ARTHUR FARRINGTON BLINN.	New York City..Ψ	Υ House
(08 e)	SAMUEL HYDE CABOT.....	Bristol, R. I...Σ	Φ Place

- (08 s) WILLIAM H. C. CARHART...*Chicago, Ill*.....X Ψ Lodge
- (08 s) WILLIAM BENNETT COLBURN..*Detroit, Mich*..A Δ Φ House
- (08 s) BYRON E. COLLINS.....*Binghamton*.....Ψ T House
- (08 e) THOMAS AMBROSE CURTIN..*Marcellus*...118 Park Place
- (08 e) CORNELIUS ERNEST ELMEN-  
DORF .....*Coeymans Hollow*.....  
B Θ Π House
- (06 e) HARRY DANIEL FULLER...*Rochester*.....Δ T House
- (06 ee) JAMES M. GAGEN.....*Amsterdam*.South Colonnade
- (08 e) GEORGE C. S. HALLA.....*Troy*.....Φ Δ Θ House
- (08 e) HAROLD LANSING KEITH...*Schenectady*..1030 State St.
- (07 ee) FRED MUNK.....*Rockville Centre*..S. S. N. C.
- (07 ee) ERNEST BAXTER OSBORNE...*Chicago, Ill*.....Σ Φ Place
- (06 ee) JOHN HENRY RAY.....*Rheims*...North Colonnade
- (07 e) ELROY SHIBLEY REEDER...*Binghamton*.....Ψ T House
- (08 e) GLENN ELLISON RICHARD-  
SON .....*Herkimer*.....Ψ T House
- (06 e) ROLLAND BARKER SMITH...*Peru*.....Δ T House
- (08 s) FRANK EARL VAN OLINDA..*Schenectady*.....X Ψ Lodge
- (08 ls) MARVIN R. VINCENT.....*Orange, N. J*.....Ψ T House
- (08 s) JOHN JACOB VROOMAN.....*Schenectady*...9 Washington  
Ave.

Irregular students—21.

### Graduate Student

MORLAND KING .....*Brooklyn*.....A Δ Φ House

Graduate student—1.

**Summary of Students, Union College**

Seniors .....	45
Juniors .....	40
Sophomores .....	61
Freshmen .....	93
Irregular Students .....	21
Graduate Student .....	1
<hr/>	
Total .....	261



## STUDENTS OF THE ALBANY MEDICAL COLLEGE

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### Fourth Year Class

HENRY FRANCIS ALBRECHT.....	Troy
FRED NICHOLAS BIBBY.....	Pottersville
JOHN BREEN.....	Wevertown
ROY MUNRO COLLIE.....	Johnstown
MOREY CHARLES COLLIER, PH. B.....	Savona
CHARLES ELISHA COLLINS, PH. G.....	Albany
FREDERICK CHARLES CONWAY.....	Albany
EDWARD ADT DEAN.....	Sardinia
THEOBOLD FRED DOESCHER.....	Albany
LEE ROY DUNBAR.....	Gloversville
WILLIS WOODFORD DUTCHER.....	Albany
VERNON R. EHLE.....	Gloversville
HERMAN ERNEST GAK.....	Fairmount
GEORGE RHEINHOLD GOERING.....	Utica
HOWELL BURROUGH GRANT.....	Afton
PERCIVAL WILLIAM HARRIG.....	Albany
JOSEPH FRIEND HARRIS.....	Albany
CLINTON BENJAMIN HAWN, B. S.....	Albany
SAMUEL ORESTES KEMP.....	Albany
WINFIELD SNELL KILTS.....	Fort Plain
WILLIAM ANDREW KRIEGER.....	Poughkeepsie
PRICE LEWIS.....	Remsen
FLOYD DEMPSTER MICHAEL.....	St. Johnsville

DAVID CUSHING NOLAN.....	Albany
CHARLES ALBERT PRESCOTT.....	North Creek
WALTER ANCEL REYNOLDS.....	Albany
JOHN FLETCHER ROBINSON, A. B.....	Albany
WILLIAM FRANCIS SHANLEY, A. B.....	Asbury Park, N. J.
WILLIS NELSON SIMONS.....	Canajoharie
EUGENE GILLIS STEELE.....	North Adams, Mass
LEMON DWIGHT WASHBURN.....	Fort Ann
EDWARD GOVE WHIPPLE.....	Malone

Fourth Year Students—32.

### Third Year Class

CHARLES SANFORD ALLEN, JR.....	Rensselaer
FLOYD JEROME ATWELL.....	Oakville
GEORGE WARREN BEEBE.....	Johnstown
JOSEPH LEWI BENDELL, A. B.....	Albany
EDWARD GEORGE BENSON.....	Albany
HOWARD PHILIP CARPENTER.....	Highland
WILLIAM DAVID COLLINS, A. B.....	Green Island
ERASTUS CORNING, A. B.....	Albany
MARCUS DENIS CRONIN.....	Wilton
WALTER THOMAS DIVER.....	Troy
JOSEPH LEWI DONHAUSER, A. B.....	Albany
ALFRED THOMAS GABRIELS, A. B.....	Watervliet
LOUIS HERBERT GAUS.....	Albany
NORMAN CHARLES GOODWIN, A. B.....	Albany
ALFRED WOODWARD GROVER.....	Kingston, Penn.

ALEJANDRO BUITRAGO GUILLIOD.....	New Paltz
AUGUSTUS JOSEPH HAMBROOK.....	Cohoes
EDWARD WILLIAM JACKSON.....	Little Falls
DEAN WARDELL JENNINGS.....	Cairo
CLARENCE ROBERT KAY.....	Amityville
ROY CHARLES KEIGHER.....	Schenectady
DAVID KIDD.....	Troy
RICHARD ANDREW LAWRENCE, A. B.....	Albany
TIFFANY LAWYER.....	Albany
JACOB HENRY LINDEN.....	Sharon Springs
ROBERT SUTTENFIELD LIPES.....	Albany
JAMES EDWARD MALONEY.....	Albany
JOHN SEARS MCCORMACK.....	Albany
JEROME MEYERS, A. B.....	Albany
ZENAS VAN DUZEN ORTON.....	Northampton
WILLIAM CLARE PORTER.....	Lestershire
STEPHEN JOHN HENRY REED.....	Schenectady
JAMES TERRANCE RILEY.....	Buffalo
JAMES JOSEPH SHEA.....	Hoosick Falls
WILLIAM CARL TREDER, PH. B.....	Albany
HERBERT JOHN WRIGHT.....	Rhinebeck

Third Year Students—36.

### Second Year Class

EARL ERRET BABCOCK.....	Deer River
FREDERICK J. BARNET.....	Albany
WILLIAM EDWARD BARTH.....	Schaghticoke

JOHN ADKINS BATTIN.....	Watervliet
HARTLEY EDWARD BOOROM.....	Interlaken
SAMUEL PIERSON BRUSH.....	Troy
EUGENE HOWARD BURNES.....	Amsterdam
WILLIAM HENRY CONGER, JR.....	Delmar
JOSEPH DAVIS.....	High Falls
NELSON KAUFMAN FROMM, A. B.....	Albany
EARL WILLIAM FULLER.....	Utica
FRANK GARTEN.....	Westchester
JOHN RONSE GILLETT, A. B.....	Albany
EDWARD FRANCIS HAGEDORN.....	Gloversville
ROSSLYN PHILIP HARRIS.....	Delanson
STANTON PERRY HULL.....	Berlin
JACOB TRAVERS KRAUSE.....	Schenectady
ALEXANDER MITCHELL LOEWENSTEIN.....	Troy
JOHN JOSEPH ALOYSIUS LYONS, PH. G.....	Albany
ROBERT DANIEL MANNING.....	Mohawk
CHARLES GIBSON MCGAFFIN, PH. B.....	Cohoes
GEORGE BOLTON McMURRAY.....	Troy
ROBERT COPELAND MOONEY.....	Gloversville
WILLIAM LESLIE MUNSON.....	Granville
JOHN PAUL O'KEEFFE.....	Hadley
CHARLES BATES PHILLIPS.....	Gloversville
GEORGE PHILO PITKIN.....	Schroon Lake
MILTON WOOLEY PLATT.....	Albany
JOHN JOSEPH RAINEY.....	Troy
EDWARD JOHN RILEY.....	Rensselaer
HUGH AUGUSTINE RILEY.....	Hoosick Falls

GEORGE STEPHEN SILLIMAN, A. B.....	Stockport
RAY ERNEST SMITH.....	Rutland, Vt.
AARON SOBEL.....	Newburgh
HERBERT EDGAR SPERRY.....	Penfield
LEONIDE GEORGE SUPRENANT.....	Cohoes
WILLIAM JAMES THOMPSON.....	Oneonta
EDWARD EVERETT TREDWAY.....	Gloversville
JOSEPH EDWARD WINDBIEL.....	Amsterdam
JOHN WINGATE .....	Princetown
PAUL VIRGIL WINSLOW.....	Warwick
CALVIN BASSLER WITTER.....	Albany

Second Year Students—42.

### First Year Class

MORRIS BELLIN .....	Albany
LEWIS WEBSTER BURDICK, B. S.....	Maryland
WILLIAM FRANCIS CONWAY.....	Albany
ARTHUR GEORGE COOK.....	Gloversville
WILLIAM HENDERSON DAVIDSON, A. B., Pd. B.....	Cohoes
EDWARD DANIEL DONOHUE.....	Glens Falls
HARRY HOUGHTON DRAKE.....	Albany
ORLA ANDREW DRUCE.....	Fulton
WAKEMAN CLARK EGERTON, A. B.....	Albany
JOHN HENRY ENGLISH.....	Cohoes
GILBERT CHARLES FISK.....	Albany
HENRY BLACKLIDGE GILLEN.....	Cohoes



WILLIAM BREESE GILLESPIE.....	Saranac Lake
ELWIN WALLACE HANNOCK.....	Albany
EDDY STEARNS HASWELL.....	Albany
HARLEY HEATH.....	Warrensburgh
THOMAS MILTON HOLMES, B. S.....	Guilderland
CHARLES VINCENT KEATING.....	Matteawan
ELLIS KELLERT.....	Albany
CHARLES JAMES KELLEY.....	Cortland
WILLIAM JOHN KENNEDY.....	Gloversville
HARRY SANDFORD LOCKWOOD.....	Fonda
ROBERT SCHOFIELD LONG.....	Frankford, Del.
WILLIAM JOSEPH LUDDEN.....	Troy
EUGENE FRANCIS MCGILLIAN.....	Green Island
JAMES GIBBONS MCGILICUDDY.....	Glens Falls
JOHN THOMAS MCGIVERN.....	Castleton
THOMAS HUGH MCGRAIL.....	Albany
THOMAS ANDREW MCGRATH.....	Hoosick Falls
BURLIN GEORGE MCKILLIP.....	Albany
FREDERICK WILLIAM MCSORLEY.....	Malone
EDWARD RAYMOND MESSER.....	Pittsfield, Mass.
ALEXANDER FRANCIS MOSHER.....	Glens Falls
NEIL BERTRAM PALEN.....	Albany
DUNCAN MACHUGH PARSONS.....	Gloversville
RALPH JOHNSON PICKERING.....	Troy
ARTHUR EMERSON PITTS.....	Cohoes
AUGUSTUS CHARLES POST.....	Catskill
WILLIAM JOHN RATE.....	Castleton
WILLIAM RUFUS RATHRUN.....	East Springfield

WILLARD TIPPLE RIVENBURGH.....	Ghent
CLARENCE LEONARD RUSSELL .....	Deposit
SAUL JOSEPH SELKIN.....	Albany
WILLIAM THOMAS SHIELDS, JR.....	Albany
CHARLES EMERSON SLATER .....	Cairo
ELTON GARRET STORM.....	Matteawan
ABRAHAM PHINEAS TERK.....	Glens Falls
HARRY FRANKLIN VAN LOON.....	Albany
FREDERICK EUGENE VAUGHAN.....	Gloversville
WALTER HARRY WATERBURY.....	East Nassau
JAMES JOSEPH YORK.....	Watervliet

First Year Students—51.

## STUDENTS OF THE ALBANY LAW SCHOOL.

---

 Senior Class

THOMAS A. ALLEN, A. B., Wake Forest College....	Durham, N. C.
GEORGE BOOCHEVER .....	Albany
THEODORE H. BURGESS, A. B., Hamilton.....	Auburn
JAMES E. CARHART, University of Michigan.....	New Baltimore
CLEMENT B. COLE.....	Romulus
RALPH M. COOPER.....	Catskill
THADDEUS G. COWELL, A. B., Union.....	Albany
FRANK H. CRONKHITE.....	Fort Edward
CHARLES W. CUNNINGHAM, Cornell.....	Greene
FREDERICK G. CURRY.....	Greenwich
BYRON L. DAVIS, B. S., Princeton.....	Saugerties
EDWARD J. DONOHUE.....	Troy
CHARLES L. EARL, JR.....	Herkimer
EDWARD D. EDDY, PH. B., Syracuse University.....	Syracuse
LEOPOLD FELIU .....	San Germain, Porto Rico
STEPHEN C. FIERO, A. B., Union.....	Saugerties
MARION H. FISHER, Yale.....	Jamestown
N. DWIGHT FORD.....	Oak Hill
EDWIN L. FOWLER.....	Altamont
JOHN L. FRAY.....	Catskill
LOUIS FRIDIGER.....	New York City
HARRISON Y. GARDNER.....	Nortonhill
IVAN A. GARDNER.....	Goshen
CLARENCE W. GORMLEY, A. B., Dartmouth.....	Troy

VIRGIL GURNSEY.....	Howes Cave
HERBERT D. HARMON.....	Brockport
JOHN L. HENNING, JR., Yale.....	Saratoga
JOSEPH P. HOGAN, A. B., University of Rochester.....	Rochester
CLARENCE G. HOTALING.....	Voorheesville
JOHN T. JACKSON.....	Schenectady
MORGAN A. JONES, A. B., Williams.....	Hudson
ETHAN W. JUDD, Yale.....	Olean
GERTRUDE L. KEEGAN.....	Binghamton
CLARENCE M. KNAPP, Cornell.....	Saratoga
HERMAN LAVERY.....	East Otto
ANDREW W. LENT, PH. B., Union.....	Highland
CARLTON H. LEWIS.....	Saratoga
ABRAM LIFSET.....	Schenectady
JOSE A. LOPEZ.....	San German, Porto Rico
GEORGE D. MACDONALD.....	Mumford
JAMES J. MAHANEY.....	Oswego
CLAUDE G. MOORE.....	Stroudsburg, Pa.
JOHN T. MORRISON.....	Johnstown
FRANK P. O'DONNELL.....	Marlborough, Mass.
JASPER G. PAGE.....	Lincoln, Vt.
ROY H. PALMER, A. B., Williams.....	Troy
WILLIAM L. L. PELTZ, B. S., Yale.....	Albany
RALPH H. PISER.....	Shushan
BENJAMIN ROWE, B. S., Princeton.....	Saugerties
WILLIAM F. RYAN.....	Fort Edward
EUGENE B. SANDFORD.....	Albany
CLAYTON F. SHERMAN.....	Highland

BENJAMIN H. SMITH.....	Patchogue
GEORGE C. STEELE, University of Rochester.....	Pittsford
WILLIAM F. STRANG, A. B., Cornell.....	Waterloo
CLEMENT G. TENNANT, PH. B., Hamilton.....	Cooperstown
JOHN B. THACHER, 2ND, A. B., Princeton.....	Albany
LEONARD A. WARREN.....	Catskill
EDWARD J. WEIDERHOLD, Cornell.....	Schenectady
MORGAN E. WELSH.....	Rock City Falls
PERLEY S. WHEELER, A. B., Cornell.....	Plattsburgh
HOWARD T. WHIPPLE.....	Malone
H. LESLIE WILBUR.....	Cambridge
JAMES E. WILLCOX, A. B., Columbia.....	Oxford
J. FRANK ZOLLER.....	Hammond
Seniors—65.	

### Junior Class

BENJAMIN I. ALLEN.....	Plattsburgh
JAMES ARMSTRONG.....	Sonora
HOWARD F. BARNES.....	Rochester
JAMES J. BRITT.....	Albany
WILLIAM L. BELKNAP, JR., A. B., Williams.....	Bridgeport, Conn.
ETHEL K. BETTS, A. B., Smith.....	Troy
ROY D. BOYD.....	Hoosick Falls
ARTHUR J. CURTIS.....	Deposit
J. STANLEY CARTER.....	Cohoes
WILLIAM CRANGLE.....	Fonda
GODFREY I. CARDELLICCHIO, A. B., Brown.....	Lacedonia, Italy



JEREMIAH W. DAVERN.....	Peru
CHARLES J. DUTTON.....	Westerly, R. I.
WILLIAM H. EARL.....	Lockport
EDWARD W. EATON.....	Waverly
GEO. W. FEATHERSTONHAUGH, JR., A. B., Union.....	Schenectady
ROBERT W. FIVEY.....	Albany
OLIVER J. FLYNN, JR.....	Albany
CHARLES H. GARDNER.....	Baldwinsville
JOHN L. GIBEAU, Montreal College.....	Cohoes
WARNER A. GRAHAM.....	Hartwick, Vt.
AUSTIN B. GRIFFIN.....	Davenport
EDWARD J. HALTER.....	Albany
SEELEY HAMILTON, 2ND.....	South Glens Falls
JACOB S. JACOBS.....	Troy
THOMAS P. KEOUGH.....	Albany
ROSE KINGSLEY, B. O.....	Kingston
EDWARD A. LAWLESS.....	New London, Conn.
ALBERT V. D. MARKHAM, R. P. I.....	Troy
FRANK P. MCARDLE.....	Albany
GEORGE A. MCARDLE.....	Albany
JOSEPH L. MCENTEE.....	Albany
JOHN J. MCGRAIL.....	Albany
EDWARD A. MEALEY.....	Cohoes
ROSCOE R. MITCHELL, A. B., Williams.....	Cohoes
LEONARD B. MOORE.....	Fort Plain
HOWARD D. MOSHER.....	Troy
WILLIAM H. MURRAY, Williams.....	Troy
DALLAS C. NEWTON.....	Geneseo

WILLIAM F. NEWTON.....	Geneseo
GEORGE A. QUIGLEY.....	Troy
OSCAR M. QUACKENBUSH.....	Oneonta
JAMES F. RILEY.....	Hudson
ISIDOR SAMPSON.....	Kingston
ARTHUR J. SMITH.....	Albany
JAMES W. SMITH.....	Troy
GRANT L. STAMFORD.....	Schenectady
JAMES R. STEVENS, JR., PH. B., Union.....	Cohoes
OGDEN STEVENS.....	Albany
CARL H. STUBIG.....	Schenectady
GRANVILLE D. STUBBS.....	Danbury, Conn.
CHARLES B. SULLIVAN, A. B., Hamilton.....	Albany
ALEXANDER J. THOMSON, PH. B., Union.....	Schenectady
BARRETT R. WELLINGTON, A. B., Williams.....	Troy
JESSE S. WICKS.....	Bainbridge
FRED W. WOSE, Harvard.....	Syracuse

Juniors—56.

STUDENTS OF THE ALBANY COLLEGE OF  
PHARMACY

---

Senior Class

FRED GRENOUGH ATWELL.....	Cohoes
WILLIAM CHANNING BARTON.....	Ballston Spa
JOSEPH WILLIAM BEAVAN.....	Scranton, Pa.
HENRY STEPHEN BERTRAND.....	Tupper Lake
JOHN HENRY CHRISTOPHER.....	Schenectady
EARLE JOHN CORTE.....	Canajoharie
MABEL DICKINSON.....	Warrensburg
KATHRYN BENEDICTA DONOHUE.....	Albany
JOHN LESLIE EVERLETH.....	Plattsburg
FRANCIS TAUSICK HEYMAN.....	Albany
LESLIE SEDGWICK HORTON.....	Nichols
EARL ALVIN HOYT.....	Deposit
GILBERT WILLIAM JEWETT.....	Watervliet
JOHN THOMAS KELLY.....	Albany
ARTHUR LESTER KINCADE.....	Johnstown
WALTER CHARLES KLAPPER.....	Schenectady
FRED SMITH LEATHERS.....	Hudson
HAROLD HAWN MATHER.....	Clayton
JOSEPH FRANCIS MITCHELL, JR.....	Cooperstown
CLAUDE ERNEST MONTANYE.....	Saratoga Springs
ROBERT COLLISON MOWITT.....	Massena
HARVEY MUDGE.....	Schenectady
JAMES JOSEPH O'KEEFFE.....	Hadley

EDWARD MELVILLE PARKER.....	Waterbury, Conn.
CHARLES IRVING PLACE.....	Catskill
WILLIAM NORTHPROP PURPLE.....	Albany
EDWARD CHARLES RETALLICK.....	Canajoharie
FRANK WAYNE RICE.....	Columbus, Ohio
CLIFFORD HARVEY RUDES.....	Dolgeville
SILAS JUDSON SANFORD.....	Nicholville
CHARLES MONROE SCOVILLE.....	Hadley
CHARLES ROY SILVERNAIL.....	Dalton, Mass.
IRA WALKER SMITH.....	Nicholville
EDWIN BELL SPALDING.....	Portland, Conn.
CARROLL WILFRED STRONG.....	Albany
WILLIAM IRA VAN ARNUM.....	Waterford
WARREN CARROLL VAN HOESEN.....	Schenevus
HARMON SEYMOUR VAN PATTEN.....	Schenectady
HARRY WALTERMIRE.....	Chatham
ALLEN HYDE WEARS.....	Madrid
JOHN PERRY WHITE.....	Delanson
IRA LEWIS WILLIAMS.....	Herkimer
LEON ELDORAS WRAY.....	Altona

Seniors—43.

### **Junior Class**

ROBERT FAULKNER AVERY.....	Hunter
LE ROY CHESTER BAKER.....	Champlain
WILLIAM LAWRENCE BAKER.....	Mechanicville
WILLIAM HENRY CANFIELD.....	Hoosick Falls

LEO EDWARD CAREY.....	Greenwich
CICERO GEORGE CLIFFORD.....	Burlington, Vt.
BERNARD FRANCIS DONAHUE.....	Norwood
JOHN HENRY DROMEY.....	Canton
HENRY ORAN FAILING.....	Canajoharie
WILLIAM BARTHOLOMEW FOODY.....	Rensselaer
FERDINAND HAVARD FRANCHOIS.....	Schenectady
PERCY SANFORD HAINES.....	Kingston
JOHN LEONARD HARRINGTON.....	Oneonta
KATHRYN ELIZABETH HICKEY.....	Long Lake
WALTER JOHN JOSEPH HOPE.....	Schenectady
JOSEPH HOUSEWELLER.....	Albany
JOHN CHARLES KONIECZNY.....	Schenectady
IDA LOUISE MOORE.....	Albany
WILLIAM MORRISSEY PRATT.....	Albany
HAROLD HUBER RELLER.....	Albany
FRED SALVIONE.....	Amsterdam
MAX ALBRECHT SHOEMAKER.....	Waverly
FREDERICK JAMES STEPHENS.....	Waterford
JOSEPH EDWARD SWEENEY.....	Ballston Spa
STUART CARROLL TAYLOR.....	Luzerne
GEORGE MARCELLUS TINNEY.....	Watervliet
WILLIAM ARCHIBALD TOWNSEND.....	Glens Falls
ELMER JAMES VAN TASSELL.....	Kingston



**Summary of Students, Union University.**

Union College.....	261
Albany Medical College.....	161
Albany Law School.....	121
Albany College of Pharmacy.....	71
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Total .....	614



UNION COLLEGE

SCHENECTADY, N. Y.

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ACADEMIC DEPARTMENT OF

UNION UNIVERSITY

UNION COLLEGE

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Union College was incorporated by the Regents of the University of the State of New York on the 25th day of February, 1795. It was the second college incorporated in the State, and the first north of the city of New York and west of the Hudson River. It received its name from the circumstance that several religious denominations co-operated in its organization, and was the first college in the United States which was not of a strictly denominational character. It has continued from its foundation to be a representative institution of Christian unity.

The first president of Union College was the Rev. John Blair Smith, of Philadelphia. He was elected in 1795, and resigned in 1799, only a few months before his death. He was succeeded by Jonathan Edwards, the younger, who died in 1801. The Rev. Jonathan Maxey, previously president of Brown University, succeeded Dr. Edwards, and resigned at the end of two years. In 1804 the Rev. Eliphalet Nott was elected president of Union College, which office he held until his death, on the 29th day of January, 1866. The Rev. Laurens P. Hickok, a graduate of the College, who had long acted as vice-president, was elected his successor. He resigned in 1868. The Rev. Charles A. Aiken succeeded Dr. Hickok in 1869, and resigned in 1871. The Rev. Eliphalet Nott Potter was elected president in 1871, and inaugurated June 20, 1872. On his resignation, in 1884, the Hon. Judson S. Landon, LL. D., was appointed president *ad interim*, and served until the inauguration of Harrison E. Webster, LL. D., who was elected president May 23, 1888, and inaugurated June 26, 1888. On his resignation, in January, 1894, Rev. Andrew V. V. Raymond, D. D., LL. D., was elected president, and inaugurated in June, 1894.

# OFFICERS OF UNION COLLEGE

## Trustees

- |             |   |  |
|-------------|---|--|
| Ex-Officio. | { | HIS EXCELLENCY FRANK W. HIGGINS, Governor. |
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|             |   | HON. JOHN F. O'BRIEN, Secretary of State.  |
|             |   | HON. OTTO KELSEY, Comptroller.             |
|             |   | HON. J. G. WALLENMEIER, JR., Treasurer.    |
|             |   | HON. JULIUS M. MAYER, Attorney-General.    |
- SILAS B. BROWNELL, LL. D., 71 Wall street, New York.
- REV. WILLIAM IRVIN, D. D., Oyster Bay.
- HON. EDWARD W. PAIGE, LL. D., 46 Cedar street, New York.
- HON. JOHN H. STARIN, Pier 18, N. R., New York.
- HON. JOHN A. DEREMER, A. M., Schenectady.
- CLARK BROOKS, A. M., 155 Broadway, New York.
- REV. GEORGE ALEXANDER, D. D., 10th street and University place, New York.
- HON. WARNER MILLER, LL. D., Herkimer.
- HON. NICHOLAS V. V. FRANCHOT, A. M., Olean.
- HON. GEORGE F. SEWARD, LL. D., 97 Cedar street, New York. City.
- EDWIN W. RICE, JR., PH. D., Schenectady, N. Y.
- EDWARD P. WHITE, A. M., Buffalo, N. Y.
- CHARLES E. SPRAGUE, PH. D., Union Dime Savings Bank, New York.
- REV. PHILIP H. COLE, D. D., Syracuse, term of office expiring June, 1906.
- PROF. FRANKLIN H. GIDDINGS, LL. D., 150 West 79th street, New York, term of office expiring June, 1907.
- SEYMOUR VAN SANTVOORD, Troy, N. Y., term of office expiring June, 1908.
- FREDERICK W. CAMERON, A. M., Albany, term of office expiring June, 1909.



**Finance Committee**

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REV. PHILIP H. COLE, D. D.

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EDWIN W. RICE, JR., PH. D.

**Treasurer**

FRANK BAILEY, A. B.

**Secretary**

EDWARD P. WHITE, A. M.

ALUMNI ASSOCIATIONS

---

## General Alumni Association

*President*, John E. Ashe, '66; *Vice-President*, J. Newton Fiero, '67; *Secretary*, Rev. W. N. P. Dailey, '84, Amsterdam; *Treasurer*, Marvin H. Strong, '96, 12 Union St., Schenectady.

## Association of New York

*President*, Frederick W. Seward, LL. D., '49; *Vice-Presidents*, George F. Seward, LL. D., '60, and Charles E. Sprague, PH. D., '60; *Secretary*, Edgar S. Barney, Sc. D., '84, 36 Stuyvesant St., New York City; *Treasurer*, Clarence Johnson, '90, 96 Fifth Ave., New York City.

## Association of Albany and North-Eastern New York

*President*, Frederick W. Cameron, '81; *Vice-President*, Edward C. Angle, '86; *Secretary*, Robert M. Eames, '99, 54 Commercial Bank, Albany; *Treasurer*, Walter S. McEwan, '95, 461 Western Ave., Albany.

## Association of Washington, D. C.

*President*, Col. Weston Flint, '60; *First Vice-President*, Rev. Joseph E. Ransdell, '82; *Second Vice-President*, Franklin P. Hough, '77; *Secretary*, Norman E. Webster, Jr., 1443 Sheridan Ave., Washington, D. C.; *Treasurer*, Philip J. Ryan, '80, 1411 Massachusetts Ave., Washington, D. C.

**Association of New England**

*President*, Theodore C. Hurd, '56; *Vice-President*, Rev. Andrew W. Archibald, D. D., '72; *Secretary*, Rev. Daniel D. Addison, D. D., '83, 2 Parkman Terrace, Brookline, Mass.; *Treasurer*, Frederick T. Rogers, M. D., '80, 117 Broad St., Providence, R. I.

**Association of the Genesee Valley**

*President*, Stephen K. Williams, LL. D., '37; *Secretary and Treasurer*, James G. Greene, '84, 52 German Insurance Building, Rochester, N. Y.

**Association of the South**

*President*, Rev. Charles S. Vedder, D. D., LL. D., '51, Charleston, S. C.; *Vice-President*, Archibald W. Ray, '83, Columbia, S. C.; *Secretary-Treasurer*, Prof. Charles J. Colcock, '75, Charleston, S. C.

**Association of the Northwest**

*President*, Henry C. Wood, '83; *Vice-President*, Eugene K. Herrick, '68; *Secretary*, Philip L. Thomson, '00, care Western Electric Co., Kansas City, Mo.; *Treasurer*, Peter B. Yates, '98, Chicago, Ill.

**Alumni Record**

The College desires to keep as full a record as possible of the residences, occupations and public services of its alumni. It also desires obituary matter. Information should be addressed to Joseph R. Brown, Jr., '03, Chairman of the Alumni Catalogue Committee, Union College Library.

FACULTY

---

ANDREW V. V. RAYMOND, D. D., LL. D.  
President

BENJAMIN H. RIPTON, PH. D., LL. D.  
Dean and Professor of History and Sociology

WILLIAM WELLS, PH. D., LL. D.  
Professor Emeritus of Modern Languages and Literature, and  
Lecturer on Current History

SIDNEY G. ASHMORE, A. M., L. H. D.  
Professor of the Latin Language and Literature

THOMAS W. WRIGHT, A. M., PH. D.  
Professor Emeritus of Mathematics

FRANK S. HOFFMAN, A. M., PH. D.  
Professor of Mental and Moral Philosophy

OLIN H. LANDRETH, A. M., C. E., Sc. D.  
Professor of Civil Engineering

WENDELL LAMOROUX, A. M.  
Librarian Emeritus

JAMES H. STOLLER, A. M. PH. D.  
Professor of Biology and Geology

EDWARD EVERETT HALE, JR., PH. D.  
Professor of English

CHARLES P. STEINMETZ, A. M., PH. D.  
Professor of Electrical Engineering

JOHN I. BENNETT, A. B.

Professor of the Greek Language and Literature

HOWARD OPDYKE, A. B.

Professor of Physics

EDWARD ELLERY, A. M., PH. D.

Professor of Chemistry

JOHN LEWIS MARCH, A. M., PH. D.

Adjunct Professor of Modern Languages

FRANK COE BARNES, A. M., PH. D.

Adjunct Professor of Modern Languages

FRANK B. WILLIAMS, C. E., M. S., PH. D.

Assistant Professor of Engineering and Mathematics

ELMER E. F. CREIGHTON, B. S., E. E.

Assistant Professor of Electrical Engineering

HORACE GRANT McKEAN, A. B.

Assistant Professor of Public Speaking and Rhetoric

HERBERT L. TOWNE, A. B., M. D.

Instructor in Physical Culture.

C. F. F. GARIS, PH. B.

Instructor in Mathematics

SAMUEL E. WEBER, B. S. in M. E.

Instructor in Civil Engineering

JOHN W. HUGHES, B. S. in C. E.

Instructor in Civil Engineering

OLIN J. FERGUSON, B. S.

Instructor in Electrical Engineering

WALTER M. CURTIS, S. B.  
Instructor in Mechanical Engineering

CHARLES H. McCULLOCH, B. E.  
Instructor in Civil Engineering

DAVID CHARLES CALDWELL, A. B.  
Assistant in Chemistry

JOSEPH R. BROWN, JR., B. S.  
Librarian

**Lecturer**

HAMILTON W. MABIE, LL. D.  
Lecturer on English Literature



## COLLEGE OFFICERS

---

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Treasurer

175 Remsen St., Brooklyn, N. Y.

CHARLES B. POND

Assistant Treasurer

College Office

WENDELL LAMOROUX, A. M.

Librarian Emeritus

JAMES H. STOLLER, PH. D.

Curator of the Museum

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Registrar

JOSEPH R. BROWN, JR., B. S.

Librarian

HERBERT L. TOWNE, M. D.

Director of Gymnasium

GEORGE CLUTE

Superintendent of Grounds and Buildings

## Standing Committees of the Faculty

---

EDUCATION—Professors Ripton, Wells, Ashmore, Wright, Hoffman, Landreth, Stoller, Hale, Steinmetz, Opdyke, Bennett, Barnes, March, Williams, Ellery and Dr. Towne.

LIBRARY—Professors Ripton, Landreth, Bennett and Librarian Brown.

CATALOGUE—Professors Opdyke, Hale and Barnes.

SCHOLARSHIPS—Professors Ripton, Stoller, Bennett and Ellery.

STAGE APPOINTMENTS—Professors Williams, Stoller and Mr. Garis.

ATHLETICS—Professors Opdyke and Bennett and Dr. Towne.

RULES—Professors Ashmore, Stoller and Hoffman.

ADMISSIONS—Professors Ripton, Ashmore, Landreth, Hale, Opdyke, Bennett, Barnes, March, Dr. Towne and Mr. Garis.

DISCIPLINE—Professors Ripton, Landreth, Hale, Bennett, March and Opdyke.

MUSIC—Professors Bennett, March and McKean.

PREPARATORY SCHOOLS—Professors Barnes and Ellery and Mr. Garis.

EMPLOYMENT BUREAU—Professors Stoller and Barnes and Dr. Towne.

SENIOR CLASS—Professors Hale, Opdyke and Creighton.

JUNIOR CLASS—Professors March and Williams and Mr. Garis.

SOPHOMORE CLASS—Professors Bennett and Barnes and Mr. Hughes.

FRESHMAN CLASS—Professors Ellery and McKean and Mr. Ferguson.

## COURSES OF STUDY

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### 1.—Courses leading to the degree of A. B.

COURSE (A)—Greek, as indicated on p. 67, is required for admission to this course. Latin and Greek are required for two years, and are elective for the remainder of the course. French and German are included, in addition to the ancient languages.

COURSE (B)—This course may be pursued by candidates who satisfy the requirements for admission to the Ph. B. course. Greek is begun on entrance and required for four years. In other respects Course B is virtually identical with Course (A).

### 2.—Course leading to the degree of Ph. B.

This course offers Latin without Greek, for which is substituted additional work in modern languages and science.

### 3.—Course leading to the degree of B. S.

This course is based upon the study of mathematics and the sciences, with extended work in English and other modern languages.

In courses 1, 2 and 3 the greater part of the work of the last two years is elective.

### 4.—General Engineering course leading to the degree of B. E.

This course is intended to give the basis of an Engineering education, including the fundamental principles of all special branches of the profession, a knowledge of both French and German and a course in English.

**5.—Sanitary Engineering course leading to the degree of B. E.**

This differs from course 4 in substituting special work in Sanitary Engineering for some of the General Engineering studies.

**6.—Electrical Engineering course leading to the degree of B. E.**

This course is intended to give a broad and thorough Engineering education, with the specific instruction requisite for Electrical Engineering.

**7.—Graduate course in General or in Sanitary Engineering leading to the degree of M. C. E.**

This course of one year's graduate study, consists of lectures, laboratory and research work, and is open to graduates of the General or the Sanitary Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

**8.—Graduate course in Electrical Engineering leading to the degree of M. E. E.**

This course of one year's graduate study consists of lectures, laboratory and research work, and is open to graduates of the Electrical Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

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Students having the profession of Medicine in view are permitted to take the first year studies of the Albany Medical College as a substitute for the studies of the first two terms of the Senior year in Union College. This enables medical students to lessen the time of their academic and professional studies by one year.

For tuition charges, see page 113.

## ADMISSION

### General Conditions.

The regular entrance examinations are held on the Thursday and Friday immediately following Commencement, and on the Monday, Wednesday and Thursday of the first week of the Fall term, as indicated in the calendar; also, at the opening of any term.

Candidates are recommended to take, if possible, the uniform entrance examinations offered by the College Entrance Examination Board, which are held annually in many places. Information concerning the time and place for these examinations can be obtained by writing to *College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.*

Candidates must be at least sixteen years old, and, as a preliminary to the entrance examinations, they must present to the President satisfactory testimonials of character, and register (see pages 73, 74) for the necessary examinations.

Candidates from other colleges must bring letters of honorable dismissal, and must pass satisfactory examinations, or present acceptable certificates.

Candidates for a degree must enter before the close of the first Senior term.

All candidates will be examined in the English requirements, and all candidates for admission to the B. S. course or to any one of the B. E. courses will be examined in Plane Trigonometry; but in other subjects Regents' diplomas or certificates from schools approved by the Faculty will be accepted, if they cover the requirements. Regents' pass-cards will be accepted, if they cover all the subjects required in any department. Blank certificates, to be filled out by principals of schools, will be furnished upon application to the Dean.

Students who enter the Freshman class by certificate and fail to maintain their class standing cannot enter the next Freshman class, except by passing the entrance examinations in the departments in which they have failed.

Candidates for any other than the Freshman class are examined also in all studies previously pursued by that class.

## Requirements for Examination in 1906

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### I. A. B. COURSES\*

Course (A)—Candidates for admission to the Freshman class in Course (A) leading to the degree of A. B. will be examined in subjects

Nos. 1, 2, 4, 5, 6, 7 and 8, of the list of subjects  
specified on pages 68-72.

Course (B)—Candidates for admission to the Freshman class in Course (B) leading to the degree of A. B. will be examined in subjects

Nos. 1, 2, 4, 5a, 6, 7 and 8 of the list of subjects  
specified on pages 68-72.

### II. PH. B. COURSE

Candidates for admission to the Freshman class in the course leading to the degree of Ph. B. will be examined in subjects

Nos. 1, 2, 4, 5a, 6, 7 and 8, of the list of subjects  
specified on pages 68-72.

### III. B. S. COURSE

Candidates for admission to the Freshman class in the course leading to the degree of B. S. will be examined in subjects

Nos. 1, 2, 3, 4a, 5a, 6, 7 and 8, of the list of subjects  
specified on pages 68-72.

For admission to this course, Latin (No. 4) may be offered, instead of a modern language (No. 5a), if desired.

### IV., V. and VI. B. E. COURSES

Candidates for admission to the Freshman class in any of the courses leading to the degree of B. E. will be examined in subjects

Nos. 1, 2, 3, 4a, 5a, 6, 7 and 8, of the list of subjects  
specified on pages 68-72.

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\*See also page 64.



LIST OF SUBJECTS

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[Not all of these subjects are required of any one candidate. Those entering any one of the given courses need present for admission only those subjects, from among the following, which are required for admission to that course. These required subjects are enumerated, for each course, on page 67.]

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## 1.—ENGLISH

All candidates for admission to the Freshman class will be required to pass a written examination in English, and no candidate will be admitted whose work is seriously defective in spelling, punctuation, grammar, or division into paragraphs.

Questions will be set on topics and extracts drawn from the following books. The first list consists of works to be read carefully, with a view to the absorption of the subject matter, *i. e.*, as books are generally read. The second list consists of books to be read with critical care, in annotated editions, and with reference to dictionary, grammar and rhetoric. The questions on this set will relate to literary form and logical structure, as well as to substance.

## LIST (1) FOR GENERAL READING.

Shakespeare's "The Merchant of Venice" and "Macbeth"; Addison's "The Sir Roger de Coverley Papers" from "The Spectator"; Irving's "Life of Goldsmith"; Coleridge's "The Rime of the Ancient Mariner"; Scott's "Ivanhoe" and "The Lady of the Lake"; Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur"; Lowell's "The Vision of Sir Launfal"; George Eliot's "Silas Marner."

## LIST (2) FOR MINUTE AND CRITICAL STUDY.

Shakespeare's "Julius Cæsar"; Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso"; Burke's "Speech on Conciliation with America"; Macaulay's Essays on Addison and Johnson.

Attention is called to the fact that while no examination in grammar or rhetoric, as such, will occur, yet a knowledge of the essential principles of grammar and of the elementary principles of rhetoric is involved in the above requirements. An acquaintance with the general outline of the development of English literature will also be required. Newcomer's Introduction to English Literature and Halleck's History of English Literature are recommended.

## 2.—MATHEMATICS

Arithmetic; Algebra, including Quadratic Equations, Proportions, Progressions and Logarithms; Plane Geometry.

In Arithmetic the examination will be on the following subjects: factors and multiples, common and decimal fractions, square root, the more important tables and operations of denominate numbers, percentage and simple interest, compound interest for integral periods only, bank discount, stocks and bonds, and the metric system.

In his preparation in Algebra the candidate should give special attention to factoring, fractional exponents and radicals, and the solution of quadratic equations by factoring and by the formula resulting from the solution of the equation  $ax^2+bx+c=0$ .

## 3.—MATHEMATICS

Solid Geometry and Plane Trigonometry. No certificate covering the requirement in Plane Trigonometry will be accepted. See page 66.

## 4.—LATIN

(a) Latin Grammar and Latin Composition (Pearson's "Exercises in Latin Composition," or an equivalent); four books of Cæsar's Gallic War, or Arrowsmith and Whicher's "First Latin Readings" (preferred); six books of Vergil's *Æneid*; six orations of Cicero; two thousand lines of Ovid, or Sallust's *Catiline*; the "Roman Method" of pronunciation.

The Grammars of West, Bennett, Lane and Morgan, Harkness (Complete Edition), Allen and Greenough, and Gildersleeve-Lodge are recommended.

- (b) Roman History (as in Wolfson), Geography of Roman Empire.

#### 4a.—PHYSICS

An elementary knowledge of Physics, such as may be gained by a year's course of study covering Mechanics, Sound, Heat, Light and Electricity. Preparation should include individual laboratory work, attested by a note-book, comprising at least thirty-five exercises, chiefly quantitative.

For recitation work, Gage's "Elements of Physics" is recommended as a text-book.

#### 5.—GREEK

- (a) Goodwin's Greek Grammar; Pearson's "Greek Prose Composition," or an equivalent; Xenophon's *Anabasis*, four books; Homer's *Iliad*, three books, including *Prosody*.

- (b) Greek History.

- (c) The Geography of Ancient Greece.

[The attention of instructors is particularly directed to the student's need of a full and accurate knowledge of the Greek and the Latin Grammar.]

#### 5a.—MODERN LANGUAGES

Either

*German*.—A knowledge of grammar, comprising declension of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax and word order; a good facility in correct pronunciation.

Ability to translate at sight a passage of German prose or poetry of ordinary difficulty, and to convert simple English sentences into German. The candidate must have read from 300 to 400 pages of prose and poetry from

various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

Or

*French*.—A knowledge of grammar, comprising the forms of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax; the more common idioms; a good facility in correct pronunciation and the ability to write from dictation.

Ability to translate at sight a passage of modern French prose or poetry of ordinary difficulty, and to convert into French simple English sentences founded upon it. The candidate must have read from 300 to 400 pages of prose and poetry from various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

The following outline is suggested as indicating the scope of the above requirements:

In German—

- |          |   |
|----------|---|
| 1st year | { Joynes-Meissner German Grammar, Part I.<br>{ Joynes' German Reader, Pages 23-128.   |
| 2d year  | { Joynes-Meissner German Grammar, Part III.<br>{ Two or more works of narrative prose fiction and<br>{ Schiller's Wilhelm Tell. |

In French—

- |          |  |
|----------|--|
| 1st year | { Whitney's French Grammar, Part I.<br>{ Super's French Reader.  |
| 2d year  | { Whitney's French Grammar, Part II.<br>{ Two to four works of narrative prose fiction.<br>{ Two to four modern plays. |

6.—HISTORY OF THE UNITED STATES

7.—MODERN GEOGRAPHY

8.—PHYSIOLOGY

**Requirements for Examination in 1907 and in 1908****IN ENGLISH IN ALL COURSES****LIST (1) FOR GENERAL READING.**

Shakespeare's "The Merchant of Venice" and "Macbeth"; Addison's "The Sir Roger de Coverley Papers" from "The Spectator"; Irving's "Life of Goldsmith"; Coleridge's "The Rime of the Ancient Mariner"; Scott's "Ivanhoe" and "The Lady of the Lake"; Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur"; Lowell's "The Vision of Sir Launfal"; George Eliot's "Silas Marner."

**LIST (2) FOR MINUTE AND CRITICAL STUDY.**

Shakespeare's "Julius Cæsar"; Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso"; Burke's "Speech on Conciliation with America"; Macaulay's Essays on Addison and Johnson.

All other requirements as in 1906.

## ENTRANCE EXAMINATIONS

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1906

Entrance examinations will be held at the college in June and in September, in accordance with the schedule given below.

*Only those who register at the appointed time will be admitted to the examinations of the following days.*

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### SCHEDULE OF THE JUNE EXAMINATIONS

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Thursday, June 14

9 A. M. *Candidates will present their credentials at the office of the President and register for examination.*

11 A. M. Algebra.

Physiology.

2 P. M. U. S. History.

Physics.

4 P. M. English.

Friday, June 15

9 A. M. Latin.      11 A. M. German.      2 P. M. Greek.

Solid Geometry.      French.

Plane Geometry.

Plane Trigonometry.



## SCHEDULE OF THE SEPTEMBER EXAMINATIONS

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Monday, September 17

2 P. M. *Candidates will present their credentials at the office of the President and register for examination.*

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## Wednesday, September 19

9 A. M. Physics.	11 A. M. Algebra.	2 P. M. U. S. History.
Physiology.		3 P. M. English.

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## Thursday, September 20

9 A. M. Latin	11 A. M. German.	2 P. M. Greek.
Solid Geometry.	French.	Plane Geometry.
		Plane Trigonometry.

## DEPARTMENTS OF INSTRUCTION

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### The Greek Language and Literature

PROFESSOR BENNETT

In Course (A), leading to the degree of Bachelor of Arts, Greek is required during the Freshman and Sophomore years, and may be elected during the Junior and Senior years; in Course (B), leading to the degree of Bachelor of Arts, Greek is begun on entrance and required for four years.

1. **Miller's Greek Testament Primer:** The New Testament in Greek.

Required of Freshmen in A. B. Course (A). Four hours weekly throughout the year.

2. **Miller's Greek Testament Primer:** The Gospel according to St. Mark.—White's First Greek Book.

Required of Freshmen in A. B. Course (B). Four hours weekly throughout the year.

3. **Xenophon:** Selections from the *Memorabilia*.—**Plato:** The *Apology*, the *Crito* and parts of the *Phaedo*.—**Theocritus:** The *Idylls* and *Epigrams*.

Required of Sophomores in A. B. Course (A). Three hours weekly throughout the year.

4. **Xenophon:** Selections from the *Anabasis* and the *Memorabilia*.

Required of Sophomores in A. B. Course (B). Three hours weekly throughout the year.

5. **Plato:** The *Apology*, the *Crito* and parts of the *Phaedo*.—**Homer:** Introductory course.

Required of Juniors in A. B. Course (B). Two hours weekly throughout the year.

6. **Homer:** The Iliad and the Odyssey in alternate years.

Required of Seniors in A. B. Course (B), and elective for Juniors and Seniors in A. B. Course (A). Two hours weekly throughout the year.

7. Candidates for honors in Greek, either in A. B. Course (A) or in A. B. Course (B), will be required to take all the work in Greek offered in their respective courses, to maintain a general average of ninety per cent. in that work, to meet for two additional hours a week during the first two terms of the Senior year for the study of a Greek text, and to write theses on assigned subjects.

## The Latin Language and Literature

PROFESSOR ASHMORE

The studies of this department are required of all Freshmen and Sophomores who are candidates for either of the two degrees, A. B. and Ph. B. In the Junior and Senior years they are elective.

1. **Freshman Latin.** Livy: Books I, XXI, XXII; Cicero: De Senectute; Tacitus; Agricola and Germania; Roman history (Botsford); Latin writing.

Required in the A. B. and Ph. B. Courses. Four hours weekly throughout the year.

2. **Sophomore Latin.** Horace: Odes and Epodes; Terence: Andria and Adelphoe. Plautus: Captivi and Trinummus; Lectures on Ancient Comedy.

Required of Sophomores in the A. B. and Ph. B. Courses. Three hours weekly throughout the year.

### Junior Latin

3. **First Term.** Satires of Horace and Juvenal; History of Roman Literature.

Two hours weekly. Elective for Juniors in the A. B. and Ph. B. Courses.

4. **Second Term.** Lectures on the archæology of Rome, with a study of Platner's "Ancient Rome."

Two hours weekly. Elective for Juniors in the A. B. and Ph. B. Courses.

5. **Third Term.** Selected Letters of Pliny the Younger; Private Antiquities of the Romans.

Two hours weekly. Elective for Juniors in the A. B. and Ph. B. Courses.

#### Senior Latin

6. **First Term.** Virgil: The Aeneid.

Two hours weekly. Elective for Seniors in the A. B. and Ph. B. Courses.

7. **Second Term.** Lucretius: De Rerum Natura.

Two hours weekly. Elective for Seniors in the A. B. and Ph. B. Courses.

8. **Third Term.** Early Latin; Inscriptions; or Selections from the Literature of the Empire.

Two hours weekly. Elective for Seniors in the A. B. and Ph. B. Courses.

Special courses may be arranged for Seniors intending to become teachers.

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Parallel reading will be recommended according to the character of the authors and subjects named in the programme. Equivalents may be substituted in the programme at any time, at the discretion of the head of the department.

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**Special Honors.** Candidates for Special Honors in Latin are required to take all the courses of the four years; to do additional private reading, as indicated by the department, and to prepare a thesis.

## Modern Languages

## German

ADJUNCT PROFESSORS BARNES AND MARCH

The courses aim to give a ready reading knowledge of German and a general acquaintance with its literature. While the literary side of the work receives chief attention after the first year, the practical is also kept in view and the study of grammatical topics and colloquial German, together with practice in writing, forms a part of every course. German is made the language of the class room whenever practicable and in some sections is used exclusively.

1. **Elementary.** Bierwirth's Beginning German, with exercises and supplementary composition. Müller and Wenckeback's Glück Auf; reading and memorizing; use of German in class.

Readings—Tales, Volkmann, Heyse, Hauff, Zschokke and others; selections on popular scientific subjects.

Required in the A. B. (B), Ph. B., B. S. and B. E. courses of Freshmen who offer French at entrance; also in the B. E. course, and, as an alternate with French, in the B. S. course, of those who offer Latin. Three hours weekly throughout the year.

- 1a. **Elementary.** Joynes-Meissner, German Grammar, Parts I. and III., with exercises; Brandt's German Reader.

Readings—Schiller: Wilhelm Tell; Goethe: Hermann und Dorothea.

Required of Sophomores in the A. B. course. Three hours weekly throughout the year.

2. **Intermediate.** Thomas's Practical German Grammar for review and reference; connected composition; use of German in class.

Readings—The time in class is devoted to the reading and discussion of selected works from the German classics and from recent drama and fiction; matter is also assigned for outside reading with reports and examination on the work

done. The work varies somewhat from year to year, but aims to give every class an acquaintance with some of the masterpieces of German literature and some knowledge of present day German life and writings.

Required in the Ph. B., B. S. and B. E. courses of Freshmen who offer German at entrance; in the A. B., Ph. B. and B. S. courses of Sophomores who have had German 1; in the B. E. course of Sophomores who passed French at entrance; and, as an alternate with 1a, in the A. B. course of Sophomores who have had two years of German before entrance. Elective in the A. B. course of Juniors who have had 1a. Three hours weekly throughout the year in the Ph. B. and B. S. (or A. B.) courses and during terms 1 and 2 in the B. E. course.

- 2a. **Intermediate.** This is a course in the reading of scientific German. A reader consisting of selections on scientific subjects forms the basis of the work and is supplemented by one or more monographs on technical subjects within the grasp of the class at this stage of its work.

Required, during the third term, of B. E. members of German 2. Three hours weekly through the term.

3. **Advanced.** Nineteenth century drama, development and leading representatives. Readings from Von Kleist and Grillparzer. *Das junge Deutschland*; assigned study. Readings from Hebbel, Ludwig and Von Wildenbruch. *Die freie Bühne*; assigned study. Nineteenth century fiction. Readings from Sudermann, Hauptmann, Meyer, Scheffel and others.

Composition. Talks on German history and legend; Stern's *Geschichten von deutschen Städten*, with assigned reading.

Elective for Juniors in the Ph. B. and B. S. courses who have done 2 and to Juniors in the A. B. course who have done 1a with a grade of 90. Required, as an alternative with French, of Juniors in the B. S. course who offered Latin at entrance, and of Sophomores in the Ph. B. and B. S. courses who in Freshman year were admitted to both German 2 and French 2.



- 3a. **Advanced.** Goethe and the classical period, readings and assigned studies. Lessing: Nathan der Weise, Emilia Galotti; Schiller: Wallenstein, Maria Stuart. Outline study of the lives of these writers. Koch: Geschichte der deutschen Literatur.

Composition as in German 3.

(Alternates with course 3. Given under same conditions.)

4. **Advanced.** Goethe: (1) A study of Goethe's life and works with readings from his autobiography (Von Jagemann's Dichtung und Wahrheit) and epic writings (Bernhardt's Meisterwerke); Egmont, Iphigenie auf Tauris, Torquato Tasso. (2) Faust: Thomas's Faust, Part I., reading and interpretation; the Faust legend in literature.

Elective for Seniors in the A. B., Ph. B. and B. S. courses who have had necessary previous training. This course will ordinarily follow course 3. Two hours weekly throughout the year.

- 4a. **Advanced.** History of German literature: Bernhardt's Deutsche Literaturgeschichte in class with Vilmar's Geschichte der deutschen Nationalliteratur for reference, accompanied by Musterbuch and special readings. Two hours weekly, first half year.

A course in Middle High German: Grammar and reading, supplemented by an outline study of the history of the language. Two hours weekly, second half year.

This course alternates with course 4, and is given under the same conditions. It is expected, though not required, that those electing it will have had course 3a. It is intended primarily for students who are preparing to teach German.

5. This course consists in the reading of one or more historical monographs and, when time allows, a historical novel, with parallel readings; followed by a careful study of a number of political speeches and parliamentary addresses, with discussion of the topics involved; supplemented by the reading of newspaper reports and editorial articles. The work aims to lay the

foundation for future study along these lines and to give some insight into present governmental and social conditions in Germany.

May be given, wholly, or in part, in any year in place of a portion of 3 or 4a.

6. **Honor Course.** Special courses, open only to members in good standing in Senior Elective German, are offered to candidates for honors in this department.
7. **Voluntary Courses.** Courses will be formed in German conversation whenever there are ten applicants and in commercial correspondence or rapid reading of recent fiction whenever there are five applicants. These courses will be given outside of schedule hours and will not count toward a degree. Open to those who have completed 1 or 1a and are in good standing in intermediate or advanced work.

### **French**

ADJUNCT PROFESSORS MARCH AND BARNES

The study of French is required of all students. A reliable practical knowledge is the first result aimed at in all the classes but as soon as possible the literary side of the language is brought to the front, and good books are read for what they contain. The more advanced courses vary somewhat from year to year, according to the judgment and preference of the instructors and the ability and character of the students composing the classes.

1. **Elementary French.** Required of Freshmen in the A. B. course (A); of Freshmen who offer German in the A. B. course (B); in the Ph. B., B. S. and B. E. courses of those who offer German at entrance; and, as an alternative with German, in the B. S. course of those who offer Latin. Three hours weekly throughout the year.
2. **Intermediate French.** This course is devoted to selected works of both the classical and the later periods.

Required of Freshmen in the Ph. B. and B. S. courses who offer French at entrance; in the B. E. course of those who do

not pass French at entrance; and, as an alternative with 1, in the A. B. course of those who have had two years of French before entrance.

- 2a. **Intermediate French.** This course is similar to course 2.

Required of Sophomores in the A. B., Ph. B. and B. S. courses who have had French 1. Three hours weekly throughout the year.

3. **Advanced French.** This course is devoted to the rapid reading of modern French works.

Elective for Juniors in the A. B., Ph. B. and B. S. courses. Required, as an alternative with German, of Juniors in the B. S. course who offered Latin at entrance and of Sophomores in the Ph. B. and B. S. courses who in Freshman year were admitted to both German 2 and French 2.

- 3a. **Advanced French.** This course is devoted to a careful study of selected works of the classic period, but in any year may be a continuation of course 3.

Elective for Seniors in A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

More advanced courses, leading to special honors in French, are offered for those students who are qualified to pursue them.

## Spanish

ADJUNCT PROFESSOR BARNES

This course is designed in the first year, to ground the student in the grammar of modern Spanish and to give a good reading knowledge of the language. In the second year a study is made of some of the literary masterpieces and a varied course in general reading is pursued. Practice in writing is continued throughout the course.

1. **Junior Elective.** Elementary course—Hills and Ford's Spanish Grammar, with exercises. Ramsey's Reader, practice and sight translation.

Readings—Padre Isla: Gil Blas de Santillana (selections); Knapp's Modern Spanish Readings; Alarcón: El Capitán Veneno.

Open to Juniors in the A. B., Ph. B. and B. S. courses and to Seniors who have not had Spanish in Junior year. Three hours weekly throughout the year.

2. **Senior Elective.** Advanced course—Grammar and composition; commercial correspondence and newspaper reading.

Readings—In connection with a brief survey of the development of Spanish literature, one or two dramas of the classical period and one or two modern plays are read, together with some works of recent fiction. The amount read depends upon the nature of the works selected and the ability of the students composing the class.

## English

PROFESSOR HALE AND ASSISTANT PROFESSOR MCKEAN

### A. Rhetoric and Composition

ASSISTANT PROFESSOR MCKEAN

1. **Freshman Rhetoric.** The work is pursued with study of a text-book, Newcomer's Elements of Rhetoric being now used.

Required of Freshmen in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

- 1a. **Freshman Rhetoric.** The work is pursued by text-book, lectures, dictations and written exercises. It is more logical and scientific in general character than course 1.

Required of Freshmen in the B. E. course. Two hours weekly throughout the year.

2. **Sophomore Rhetoric.** The work consists in the writing of orations with criticism and a delivery of them, either in special appointments or before the class, and the writing and criticism of essays.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. One hour weekly in the winter and spring terms.

Required of Sophomores in the B. E. course. One hour weekly throughout the year.

3. **Junior Rhetoric.** The work is like that of 2, but of a more advanced character. Required of all Juniors. One hour weekly throughout the year.
4. **Argumentation and Debate.** The work follows Alden's Art of Debate, but gives a good deal of practice in preparation of briefs and arguments and in oral debates.

Elective for Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

5. **Senior Rhetoric.** The work is like that of 2, but of a more advanced character.

Required of all Seniors in the A. B., Ph. B. and B. S. courses. One hour weekly throughout the year.

- 5a. **Senior Rhetoric.** One literary essay each term.

Required of Seniors in the B. E. course during the fall and winter terms.

## **B. The English Language and Literature**

PROFESSOR HALE

1. **Old and Middle English.** This course gives an introduction to the language in Cook's First Book in Old English, and then carries on the work in one of the following lines:
  - (a.) An introduction to Beowulf.
  - (b.) A reading of West Saxon prose.
  - (c.) An introduction to Middle English.

Elective for Juniors in all courses. Two hours weekly throughout the year.

2. **Sophomore English.** (a) The history of English literature. Given with a text-book in the fall and winter terms. (b) Shakespeare. The study of one or two plays as in 2a. Given in the spring term.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

- 2a. **Sophomore English for Engineers.** A number of the plays of Shakespeare are read; at first Hamlet with particular attention to the language, action and characters, and a review of questions of text, date and sources. A view is also given of the conditions of the Elizabethan Theatre. In the winter Romeo and Juliet, King Lear and The Tempest are read more rapidly.

Required of Sophomores in the B. E. course in the fall and winter terms. Three and two hours respectively.

3. **Junior English.** The study covers, during the year, the Short Story and the Novel, the Essay, and the Oration. In each case the class follows the historical development of the literary form with especial attention to specific characteristics of the various authors, with frequent exercises.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

4. **Senior English.** An introduction to the critical study of Poetry. The course is pursued in much the same way as 3, except that instead of different forms of literature, different poets of the nineteenth century are studied. Scott, Byron, Shelley, Keats, Tennyson, Browning and Wordsworth are principally studied as giving examples of the chief kinds of poetic character.

Elective for Seniors in all courses. Two hours weekly throughout the year.



## History and Sociology

PROFESSOR RIPTON

The work of the department covers three years, beginning with the first term of the Sophomore year. The instruction is given by text-book, by lectures, and by library references.

1. **English History.** The narrative history of England is made the basis of study, but especial attention is given to the industrial, commercial and social history of the country, and to the development of the English Constitution. The importance of collateral readings from the English authorities is emphasized.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, first and second terms.

2. **French History.** Beginning with a brief study of Roman Gaul, the main purpose is to show the growth of the French nation and the working of the different forces which promoted or retarded French unity. The period studied concludes with the year 1789. The history of France from that date to the present is taken up in greater detail in Course 4.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, third term.

3. **American History.** A study is made of the period of American discovery and exploration and of the colonial period. The main part of the work, however, begins with an examination of the causes of the American Revolution. The course is guided by text-books and lectures, and much work is done in the library among the sources and authorities.

Elective for Juniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

4. **French Revolution and Nineteenth Century.** This course considers the causes, ideas and progress of the French Revolution and the reconstruction of European politics and society produced by the revolutionary and Napoleonic wars. It then takes up an examination of the events and forces which contributed to the unification of Italy and of Germany, and

concludes with a brief study of the Eastern Question. The course is designed to give a clear understanding of political affairs as they exist in Europe to-day and the historical processes by which they were brought about.

Elective for Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

5. **Comparative Politics.** A comparative study is made of the constitutions and governments of England, the United States, and the principal nations of Continental Europe. Sufficient attention is given to historical origins to account for characteristic differences, but the work consists mainly of a systematic study of the constitutions, their adoption and methods of amendment, the distribution of governmental powers, and their practical operation, including some account of political parties.

Elective for Seniors. Two hours weekly throughout the year.

6. **Economics.** It is the design of this course to give instruction in the leading principles of Economics. While a text-book is used in order to secure more rapid progress, still the views of no school are taught exclusively. By lectures and required collateral reading an attempt is made to present the results of the latest and most approved investigations in the science. The course closes with a series of lectures upon the history of Political Economy.

Required of Seniors in all courses. Three hours weekly, first term.

7. **Sociology.** In this course the mutual relations of men in society are examined historically, that the student may learn how present conditions have resulted from past experience. Present social forces and needs are considered, with the purpose of training the students to fulfill the demands of good citizenship. The collateral reading and practical sociological investigation is guided throughout the course by lectures.

Required of Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

**Mental and Moral Philosophy**

PROFESSOR HOFFMAN

The courses in this department begin with the first term of the Junior year and extend through the entire Senior year. Logic, Experimental Psychology and Elementary Ethics come in the Junior year and are required. All the other courses are taken up in the Senior year and are elective. Instruction in the various studies of the department is usually given by means of lectures, discussions, and the use of a text-book.

1. **Logic.** This study, inasmuch as it is required, is confined to the simple elements of the science. As soon as the rules of correct thinking are mastered, the student is put at once to the analysis of arguments, the chief purpose of the study being to develop skill in detecting fallacies. Extracts from many authors are brought before the class for criticism, and so far as possible they are taken from every field of thought.

Required of Juniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during first term.

2. **Elementary Psychology.** This course is designed to acquaint the student with the most obvious facts of his mental experience; and the attempt is made to classify these facts into a system. The relation of Psychology to the other sciences is set forth, and the importance of the study is emphasized in that it lays the foundation for all the sciences of man as a political, moral and religious being.

Required of Juniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during second term.

3. **Elementary Ethics.** Only the outlines of the subject are presented in this course. The ordinary duties of man are pointed out by first describing those concerning himself and those that arise from his relation to others, to nature, and to God.

Required of Juniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during third term.

4. **Advanced Psychology.** The chief problems discussed in this course are the recent views concerning the nature of perception, the localization of functions and the theories concerning memory, conception, the emotions and the will. The facts of abnormal Psychology are also here considered, especially insanity, dreams, hypnotism, telepathy, and the hypothesis of a secondary self.

Elective for Seniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during first term.

5. **Advanced Ethics.** Some account of the history of Ethics is given in this course, and present ethical theories are stated and discussed. The relation of Ethics to other sciences is emphasized and much attention is given to the ethical problems involved in such questions as education, taxation, transportation, corporations, the treatment of criminals, the care of the poor, and the formation and dissolution of the family.

Elective for Seniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during second term.

6. **Evolution of Religion.** The object of this course is to show how religion originates and to trace out the steps taken in its development. The chief ideas of the leading religions of the heathen world are critically examined, their excellencies and defects are pointed out, and a comparison of them is made with the special doctrines of the Christian system.

Elective for Seniors in the A. B., Ph. B. and B. S. courses.  
Three hours weekly during third term.

7. **History of Philosophy.** The attempt is made in this course to go over with considerable detail the general field of Philosophy from the earliest times down to the present day. In this way the views of the principal thinkers of the world are presented and discussed upon a great variety of problems, such as the validity of knowledge, the nature of virtue, the foundations of the State and the existence of God. Much is made in this course of the historical connection of the

different systems for the purpose of impressing upon the mind of the student the successive steps that have been taken in the actual development of thought.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

## Mathematics

ASSISTANT PROFESSOR WILLIAMS, MR. GARIS, MR. HUGHES AND MR. MCCULLOCH

Mathematics is required of Freshmen in all courses, and of Sophomores in the B. E. course. Elective work is offered in the Sophomore, Junior and Senior years of the A. B., Ph. B. and B. S. courses, and in the third term Senior year of the B. E. course.

In the B. E. course especial effort is made to incite the student to independent thinking, and to enable him to apply his knowledge of mathematics to his technical work, at the same time holding him to rigorous methods and logical conclusions.

In the A. B., Ph. B. and B. S. course the object is to train the student to habits of logical thought and deduction, to give him a knowledge of modern methods, and to bring him, as far as time will permit, in touch with the more important fields of mathematics. For the teacher of mathematics in preparatory schools the way is thus prepared to see more clearly the relation of his work to that which follows, and for the student who wishes to pursue the study of mathematics a broad foundation is laid.

The following courses are given:

1. **Solid Geometry.** Wentworth's Geometry.

Required of Freshmen in the A. B. and Ph. B. courses.

Four hours weekly during first term.

2. **Algebra, including elements of determinants.** Downey's Algebra.

Required of Freshmen in the B. S. course during first term, and of Freshmen in the A. B. and Ph. B. courses during second term. Four hours weekly.



- 2a. **Algebra**, including elements of determinants. Downey's Algebra.

Required of Freshmen in the B. E. course. Four hours weekly during first term.

3. **Trigonometry**.

Required of Freshmen in the A. B. and Ph. B. courses. Three hours weekly during third term.

- 3a. **Trigonometry**.

Required of Freshmen in the B. E. course. One hour weekly during third term.

4. **Analytic Geometry**. Tanner and Allen's Analytic Geometry.

Required of Freshmen in the B. E. course. Four hours weekly during second term, and two hours weekly during third term.

- 4a. **Analytic Geometry**. Tanner and Allen's Analytic Geometry.

Required of Freshmen in the B. S. course. Three hours weekly during second and third terms.

- 4b. **Analytic Geometry**. Tanner and Allen's Analytic Geometry.

Elective for Sophomores in the A. B. and Ph. B. courses. Two hours weekly throughout the year.

- 4c. **Modern Analytic Geometry**. Advanced course.

Elective for Juniors and Seniors in the A. B., Ph. B. and B. S. courses who have had 4b or 4a. Two hours weekly during first term.

- 4d. **Higher Plane Curves**.

Elective for Juniors and Seniors in the A. B., Ph. B. and B. S. courses who have had 4c. Two hours weekly during first term.



**5. Calculus.** Murray's Infinitesimal Calculus.

Elective for Sophomores in the B. S. course and Juniors in A. B. and Ph. B. courses. Two hours per week throughout the year.

**5a. Calculus.** Murray's Infinitesimal Calculus.

Required in B. E. course. Three hours weekly during third term of Freshmen year, three hours weekly during first and second terms, and two hours weekly during third term of Sophomore year.

**5b. Calculus.** Advanced course. Murray's Infinitesimal Calculus.

Elective for Seniors in the A. B. and Ph. B. courses, and Juniors in the B. S. course who have had 4c. and 5. Two hours weekly during third term.

**6. Differential Equations.** Murray's Differential Equations.

Elective for Seniors in the B. E., A. B. and Ph. B. courses, and for Juniors in the B. S. course who have had 5b. Two hours weekly during third term.

**7. Quadric Surfaces.**

Elective in the A. B., Ph. B. and B. S. courses of Seniors who have had 4d. Two hours weekly during second term.

**8. Theory of Functions.**

Elective in A. B., Ph. B. and B. S. courses of Seniors who have had 7. Two hours weekly during third term.

Candidates for special honors will be given advanced work under 4d, 6, 7 and 8, or work in Synthetic Geometry, Elliptic Functions and Groups.

## Mechanics and Physics

PROFESSOR OPDYKE

The required work in Physics extends through the three terms of the Sophomore year. This is followed by electives in laboratory work and in Mathematical Physics. The collection of apparatus for the illustration of lectures is extensive, and has been secured largely from foreign makers, including sets of standard pattern by Koenig, Duboseq, Ruhmkorff and others.

The courses in more detail are these:

1. **General Physics.** This course is intended to give a general presentation of the facts and laws of Physics. No knowledge of mathematics is assumed beyond an acquaintance with Algebra and Plane Trigonometry. Experimental lectures, recitations and discussions aim to make the student familiar with the chief phenomena of Physics and their explanation.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

- 1a. **Elective in Laboratory Work.** This course is open to those who have taken 1, and consists of individual work by the students themselves in the laboratory. The experiments performed are such as allow accurate measurement of the quantities involved; and the results obtained are used to verify some general law, or to obtain some physical constant of nature.

Elective for Juniors and Seniors in the A. B., Ph. B. and B. S. courses. Two periods of two hours each weekly throughout the year.

2. **General Physics for Engineers.** This course treats the subject more mathematically than 1, and is given to students in the Engineering course. The Calculus is used, more especially during the second and third terms. Assuming some knowledge of the fundamental facts of Physics, attention is paid to the discussion of the phenomena and their mathematical analysis, in so far as this is possible with the use of the more

elementary analytical methods. The work consists of lectures, recitations and laboratory practice.

Required of Sophomores in the B. E. course. Two, three and three classroom hours a week throughout the first, second and third terms, respectively; and one laboratory period a week throughout the year.

- 2a. **Elective in Mathematical Physics.** This course is open to those who have taken 2, and aims to carry out and complete the mathematical discussion of some parts of the subject. A good knowledge of Calculus is required, and an elementary knowledge of Differential Equations. Some time is devoted to a further study of Differential Equations as applied to physical problems, and through lectures and assignments of reading the student is introduced to more advanced work.

Elective for Juniors and Seniors who have taken 2. Two hours a week throughout the year.

3. **Astronomy.** A short course in Astronomy is also given. This course is general and descriptive in character, including some reference to the more elementary trigonometrical and mechanical aspects of the subject.

Required of Juniors in the General and Sanitary B. E. courses, and in the A. B. and B. S. courses, and open as an elective to the Juniors in the Ph. B. course. Three hours a week throughout the third term.

## Chemistry

PROFESSOR ELLERY AND MR. CALDWELL

The object of the instruction in this department is to develop power of accurate observation, of logical reasoning, and of forming correct judgments on observed facts. Students who are planning special courses in Chemistry, Medicine, Biology, Geology, or other branches of natural science, will find the courses of great value.

1. **General Chemistry.** The course includes an exhaustive study of the non-metals and their compounds, together with the fundamental laws and theories of Chemistry, a special study of the common metals, and an introduction to Organic Chemistry. The work is distributed through the year as follows:

Fall term: Theories and general principles; study of the occurrence, preparation and properties of the non-metals.

Four lectures and one laboratory period each week.

Winter term: Study of the occurrence, metallurgy and properties of the common metals, and reactions of salts of the metals in solution.

One lecture and two laboratory periods each week.

Spring term: Study of reactions of acid radicals in solution. Elementary blowpipe analysis.

Three laboratory periods each week.

Required of Sophomores in the B. E. course.

- 1a. **General Chemistry.** This course is similar to course 1, in that it includes the study of metals and non-metals, theories and principles, but no analytical work is done.

Required of Freshmen in the B. S. course, and of Sophomores in the Ph. B. course. Elective for Juniors and Seniors in the A. B. course. Two lectures and one laboratory period a week throughout the year.

2. **Qualitative Analysis.** This course comprises a systematic examination of metals and acid radicals in solution, and a systematic examination of complex solids.

Required of Juniors in the B. E. course. Three laboratory periods a week during the fall term.

- 2a. **Qualitative Analysis.** A study of the reactions of bases and acids in solution, a complete course in blowpipe analysis, a systematic examination of solutions of metals and acids, and of complex solids. The aim of the year's work is to enable

the student to make a complete qualitative analysis of complex inorganic substances.

Elective for Juniors and Seniors in the Ph. B. course, for Sophomores in the B. S. course, and for Seniors in the A. B. course who have had course 1a. Three laboratory periods a week throughout the year.

3. **Quantitative Analysis.** This is a course in which the student becomes familiar with the various gravimetric and volumetric methods of analysis.

Elective for Juniors in the B. S. course, and for Seniors in the Ph. B. course, who have had course 2a. Three hours a week throughout the year.

4. **Organic Chemistry.** This course comprises analysis of organic compounds, the preparation of typical organic substances, and a thorough study of the principles and theories of organic chemistry.

Elective for Seniors in the B. S. course, who have had course 3. Three hours a week throughout the year.

5. **Special Analyses.** This course includes Quantitative Analysis, both gravimetric and volumetric determinations of common elements, a thorough course in Water Analysis, comprising a study of proper sanitary conditions, as well as complete chemical analysis of various samples of water, collected by the student, and a short course in milk analysis.

Required of Seniors in the Sanitary Engineering course. Two hours a week during the fall and winter terms.

6. **Chemical Technology.** This course consists of a series of lectures on the more important industries which make practical use of Chemical Principles, and includes a discussion of the essential Chemical Processes employed. Fuels, sewage, factory waste, the manufacture of sulphuric acid, soda, glass, salt, paper, etc., are some of the topics presented.

Elective for Seniors. Two hours a week during the spring term.



## Biology and Geology

PROFESSOR STOLLER

In the study of these sciences the objects sought to be accomplished may be summarily stated as follows: 1. To broaden the student's knowledge of the world of external nature by acquainting him with the salient facts and principles of the sciences which treat of animals and plants and of the earth. 2. To train the student in the methods of scientific study, so that he learns to acquire knowledge at first hand, that is, to observe, compare and interpret the facts and phenomena of nature and to depend upon his own powers of acquisition and understanding, rather than upon books or ready-to-hand sources of information. 3. To acquaint the student with the bearings of these sciences upon matters of practical importance, as the relation of the life processes of certain groups of organisms to human diseases, and the applications in sanitary science and therapeutics of our knowledge of these matters; the anatomy and physiology of animals, especially the vertebrates, as a foundation for human anatomy and physiology; the food and nutrition of plants with reference to agriculture; the growth of trees and the tissue structure of woods with reference to forestry and the uses and values of timbers; the occurrences and economic values of many of the materials considered in geologic science, as building stones, mineral ores, fuels, etc., etc. 4. To afford the student a grasp of the great inductions of biologic and geologic science in their general philosophical values; the history of the earth and its organisms; the idea of evolution and the scientific evidences of a process of organic evolution; the theories of various authors as to the causal factors of the process; and, finally, the meaning of nature as an expression of creative energy.

1. **General Biology.** This course is intended to give the student a knowledge of living plants and animals, to afford mental training in the study of nature, and to give the student a grasp of the broader facts and principles of biological science in their general philosophical values. Recitations and laboratory work.

Required of Sophomores in the B. S. course, three hours



weekly throughout the year, and of Juniors in the Ph. B. course during the first two terms.

2. **Animal Morphology.** This course is adapted for students who wish a somewhat advanced knowledge and training in biology, especially as a preparation for teaching or for the medical profession. The work is mainly in the line of comparative anatomy, and includes the dissection of several vertebrate types in detail. Some time is given to elementary histology and embryology, involving the technique of section-cutting, etc. The course includes the reading of texts in general zoology and embryology.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours (six hours of laboratory work) weekly throughout the year.

3. **Bacteriology.** Students who have elected course 2 may be permitted to take, in the third term, elementary practical bacteriology as an extra or in place of a part of the anatomical work.
4. **General Principles of Zoology.** The aim of this course is to use the data of zoology for their worth as contributing to liberal culture. The more general facts and principles of animal structure, function and development are reviewed and considered in their relation to the study of man. The scientific evidences of organic evolution and the theories of evolution of various authors are considered. Lectures.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

5. **Sanitary Biology.** In this course those organisms, especially bacteria, which bear a causal relation to disease and the recent applications in sanitary science of our knowledge of the nature of these organisms, are considered. Some laboratory work in bacteriology is done.

Required of general and sanitary engineers in the Senior class. Two hours weekly during the second term.

6. **General Geology.** The instruction in this course is adapted primarily to the study of the science as a branch of liberal culture, but enough practical work is included to afford a foundation for special study or for teaching. The work includes laboratory study in determining the common minerals and rocks, and some field work in structural and historical geology.

Required of Juniors in the A. B. and B. S. courses; elective in the Ph. B. course. Three hours weekly in the first term.

7. **Field Geology.** This course is supplementary to the preceding. The geological formations readily accessible from Schenectady are inspected, fossils are collected and readings from the State geological reports and other literature of the science are made.

Required of Ph. B. students who elect the preceding course. It may be taken as an extra, by permission of the faculty, by A. B. and B. S. students who have taken the preceding course. Three hours a week during third term.

8. **Economic Geology.** In this course, after a brief study of the principles of dynamic and structural geology, the work is related to the occurrence and distribution in the United States of building stones, mineral ores, coal and other economic products. Recitations, lectures and some laboratory work. Required of Seniors in the B. E. courses. Two hours weekly during the first term.

## Physiology and Physical Education

DR. TOWNE.

Human Anatomy, Physiology, Hygiene and Physical Education are required in all courses. In the Freshman year the work consists of recitations, demonstrated by means of the manikin and the human skeleton. A thorough study of the human body is made, so that the student is more able to understand the benefits resulting from systematic bodily exercise.

The course in the gymnasium is so arranged as to give a practical knowledge of the different apparatus pertaining to physical training. Commencing with light work, consisting of free gymnastics, club, dumb-bell and wand exercises, the course leads through a graded series, involving heavier work as the student becomes fitted for it.

At the beginning of the second year Hygiene is taken up, the aim being to give a course which is practical. With this end in view, certain lectures are also given, in connection with the subject, on "First Aid to the Injured."

It is the aim of the department to give the student such a training in the methods of Physical Education that he may have a comprehensive knowledge of the subject, and to secure health, vigor and such harmonious development of the body as will fit it to resist disease, and prepare it for efficient service, both now and later in life.

A thorough physical examination of each student is made in the fall, and the measurements are outlined on charts, so as to show the parts below the normal development, for which special exercises suited to the health and physical condition of each individual are prescribed.

In connection with the college is a gymnasium, equipped with new apparatus and adapted to the purposes of providing excellent opportunities for physical training. It is open from 7 a. m. to 6 p. m. during the college year to all classes for voluntary work. All kinds of athletic sports are encouraged, as much as possible, under the advice and guidance of the department.

## LECTURES

It is the policy of the college to provide its students with the advantages of frequent lectures by specialists in the various departments of knowledge.

## THE LIBRARY

The library occupies Nott Memorial Hall. It contains forty thousand volumes and includes the engineering and scientific library of the late Professor Gillespie, the collection of mathe-

matical works made by the late John Patterson, of Albany; the library of the late Hon. Henry J. Cullen, of the class of 1860, and the library of ancient and classical language and literature of the late Professor Tayler Lewis. The income from a bequest of five thousand dollars left by the late Lemon Thomson, Esq., of Albany, of the class of 1850, is devoted to the purchase of books on American subjects, especially history and political science. An alcove, known as the "Thomson Alcove," is reserved for these books. By the will of the late Rev. Oscar Blakeslee Hitchcock, of the class of 1852, a bequest of upwards of thirty thousand dollars was left to the College for the purchase of books, manuscripts, etc. The library is catalogued according to the Dewey decimal system.

One hundred and fifteen periodicals and the transactions of many learned societies are received.

### Library Rules

Hours 8-1; 2-6; 7-9 from Monday to Friday. 9-1; 7-9 on Saturday.

The library will be closed on Sundays and legal holidays.

The library will be open during vacations at hours to be announced.

Loan of books: Reference, Cullen and valuable books are not to be loaned.

Reserved books may be loaned over night, i. e., from 9 p. m. to 8 a. m. There will be a fine of \$1.00 per day or part of a day for each reserved book overdue.

Periodicals are regarded as reference books.

All other books may be loaned, not more than two at a time, for a period of two weeks, and may be once renewed, unless called for. A fine of ten cents per day will be charged for all books overdue and all library privileges will be withdrawn until the book is returned and the fine paid.

## THE NATURAL HISTORY MUSEUM

PROFESSOR STOLLER, CURATOR

It is expected that during the current year the main body of the collections will be transferred to the third floor of Nott Memorial Hall. The opportunity will be used, as far as possible, to rearrange them, and to set them in order with reference to their preservation and their educational use.

In Zoology, the collection of mounted birds numbers 311 specimens, representing 161 species of the bird fauna of the Eastern United States. These have recently been carefully inspected, and will be reclassified and labelled. Of mammals there is a collection of 57 skins, the gift of the U. S. National Museum, and a number of skulls, skeletons and mounted specimens. Fishes, amphibia and reptiles, especially of the local fauna, are represented by specimens in alcohol. In the department of invertebrates the collections of marine animals made by Dr. Harrison E. Webster are extensive, including sponges, corals, worms, crustacea and mollusks, the total number of species represented being over 5,000. The Wheatley collection of shells, presented by E. C. Delavan, Esq., consists of 8,000 specimens. The botanical collections include a nearly complete set of local flowering plants, the work of Professor Jonathan Pearson. To this there has since been added a complete set of the ferns and fern allies of Schenectady County. The flora of the United States is further represented by collections from Virginia, the Red River region of the Southwest, and those made by Dr. Nevius in Alabama. The lower cryptogams are represented by a valuable collection of 2,300 specimens of fungi, the gift of Mr. J. B. Ellis, of the class of 1851. The Herbarium also includes a considerable number of foreign plants, including representative collections from Germany, Spain, Asia Minor and England, as well as some specimens from Iceland, Norway, France and Switzerland. They have been sorted and distributed in a single series following the latest accepted sequence, that of Engler and Prantl's *Natürliche Pflanzenfamilien*, making the entire collection of some 8,000 or 10,000 specimens readily accessible for reference and study.

In Mineralogy, the Wheatley collection of minerals given by E. C. Delavan, Esq., which is labelled according to the system

of Dana, contains 4,000 specimens, many of which represent the more valuable forms.

In Geology there is a general collection of rocks and minerals, comprising some 3,000 specimens; and a considerable collection of Paleozoic and Mesozoic fossils. The collections made by the geological department under the direction of Professor C. S. Prosser so increased the museum that there is plenty of material now available, especially, for the careful study of the Paleozoic rocks and fossils of the New York formations.

Recently there has been added the educational series of rock specimens, the gift of the United States Geological Survey.



CURRICULUM OF THE A. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Greek 4 Latin 3 French, or German 2 Rhetoric 4 Solid Geometry 1 Physiology Greek Prose Composition Latin Prose Composition	4 Greek 4 Latin 3 French, or German 2 Rhetoric 4 Algebra 1 Physiology 1 Gymnastics Greek Prose Composition Latin Prose Composition	4 Greek 4 Latin 3 French, or German 2 Rhetoric 3 Trigonometry 1 Physiology 1 Gymnastics Greek Prose Composition Latin Prose Composition
Sophomore Year	3 Greek 3 Latin 3 German, or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 1 Hygiene	3 Greek 3 Latin 3 German, or French 3 English and Rhetoric 3 Physics 2 History or Mathematics	3 Greek 3 Latin 3 German, or French 3 English and Rhetoric 3 Physics 2 History or Mathematics
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>2</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see pages 107, 108.

CURRICULUM OF THE PH. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Latin 3 German 3 French 2 Rhetoric 4 Solid Geometry 1 Physiology Latin Prose Composition	4 Latin 3 German 3 French 2 Rhetoric 4 Algebra 1 Physiology 1 Gymnastics Latin Prose Composition	4 Latin 3 German 3 French 2 Rhetoric 3 Trigonometry 1 Physiology 1 Gymnastics
Sophomore Year	3 Latin 3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 1 Hygiene	3 Latin 3 German or French 3 English and Rhetoric 3 Physics 2 History or Mathematics 3 Chemistry	3 Latin 3 German or French 3 English and Rhetoric 3 Physics 2 History or Mathematics 3 Chemistry
Junior Year	3 English and Rhetoric 3 Logic 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Psychology 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Ethics 3 Biology 7 Elective <sup>2</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see pages 107, 108.

CURRICULUM OF THE B. S. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 4 Algebra 3 Chemistry 1 Physiology	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 3 Analytic Geom- etry. 3 Chemistry 1 Physiology 1 Gymnastics	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 3 Analytic Geom- etry 3 Chemistry 1 Physiology 1 Gymnastics
Sophomore Year	3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Students who offer Latin at entrance take German or French, one of which is continued through Junior year.

<sup>3</sup>For list of electives, see pages 107, 108.

LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments.]

JUNIOR YEAR<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
3 German	3 German	3 German
3 French	3 French	3 French
3 Spanish	3 Spanish	3 Spanish
2 Anglo-Saxon	2 Anglo-Saxon	2 Anglo-Saxon
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Advanced Rhetoric— Argumentation	2 Advanced Rhetoric— Argumenta- tion	2 Advanced Rhetoric— Argumenta- tion
3 American His- tory	3 American His- tory	3 American His- tory
2 Modern Analytical Geometry	2 Advanced Calculus <sup>3</sup>	2 Differential Equations
2 Calculus <sup>2,4</sup>	2 Calculus <sup>2,4</sup>	2 Calculus <sup>2,4</sup>
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
3 General Chem- istry <sup>2</sup>	3 General Chem- istry <sup>2</sup>	3 General Chem- istry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 General Geology	3 General Geol- ogy	3 General Geology
3 Biology <sup>3</sup>	3 Biology <sup>3</sup>	3 Biology <sup>3</sup>
3 Geology, As- tronomy, Evolution <sup>4</sup>	3 Geology, As- tronomy, Evolution <sup>4</sup>	3 Geology, As- tronomy, Evolution <sup>4</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week required for class work.

<sup>2</sup>For the A. B. course. <sup>3</sup>For the B. S. course. <sup>4</sup>For the Ph. B. course.

## LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments.]

SENIOR YEAR<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
2 Spanish	2 Spanish	2 Spanish
3 Spanish <sup>3</sup>	3 Spanish <sup>3</sup>	3 Spanish <sup>3</sup>
2 German or French	2 German or French	2 German or French
2 English Poetry	2 English Poetry	2 English Poetry
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Comparative Politics	2 Comparative Politics	2 International Law
3 European His- tory	3 European His- tory	3 European His- tory
3 History of Phi- losophy	3 History of Phi- losophy	3 Evolution of Religion
3 Advanced Psy- chology	3 Advanced Ethics	3 History of Phi- losophy
2 Modern Analytical Geometry	2 Advanced Cal- culus	2 Differential Equations <sup>3</sup>
2 Higher Plane Curves	2 Geometry of Three Di- mensions	2 Theory of Functions
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
2 Physical Labo- ratory	2 Physical Labo- ratory	2 Physical Labo- ratory
3 General Chem- istry <sup>2</sup>	3 General Chem- istry <sup>2</sup>	3 General Chem- istry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 Organic Chem- istry	3 Organic Chem- istry	3 Organic Chem- istry
3 General Geol- ogy	3 General Geol- ogy	3 General Geol- ogy
3 Invertebrate Morphology	3 Vertebrate Anatomy	3 Comparative Vertebrate Anatomy

<sup>1</sup> The figure at the left indicates the number of hours per week required for class work.

<sup>2</sup> For the A. B. course.

<sup>3</sup> For those who have not had Spanish in Junior year.

FOR THE  
CURRICULUM  
OF THE  
B. E. COURSES

See pages 162-167.



## GENERAL REGULATIONS

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**Registration.** Every student must report at the Registrar's office at the beginning of each term and register college or local residence. Any change of residence during the term must be reported at once, in conformity with the regulation made by the Treasurer's office.

**Residence.** Students are not allowed to change their college rooms during the term without permission of the Treasurer; for every change the sum of two dollars is charged. Students must conform to college rules regarding keys.

**Reports.** A daily record of scholarship and of attendance at class and chapel is kept, and is transmitted at the close of each term, or more frequently, to the student's parent or guardian.

**Standing.** There are four grades of scholarship:—from 9 to 10 inclusive, first grade; from 8 to 8.9, second grade; from 7 to 7.9, third grade; from 6 to 6.9, fourth grade. A student who receives a mark of 4 to 5.9 is reported as conditioned; below 4, as failed. In the mathematical studies of the engineering course the sustaining mark is 7, and any mark below 5 indicates failure.

A student who is reported as having failed in any subject must take that subject again in class; or he may be required, at the option of the department concerned, to make up the subject under an approved tutor, in such manner as the department may designate, and to pass an examination in the same at the second conditions examination after the imposition of the mark of failure.

Those receiving the three highest marks for the whole course in the Engineering Department and the seven highest marks in the other departments are entitled to appointment as Commencement Orators.

**Absences in General.** Absences are recorded as of three kinds—permitted, excused and unexcused. No one but the President or Dean can authorize the record of an absence as permitted.

Absences are entered (in every course) against a student

from the beginning of a term until he reports his return to the Registrar. A like report is required after absence because of sickness or permission.

**Class-room Absences.** Students will be allowed, each term, as many absences without excuse, in any subject, as there are recitations per week in that subject.

After this limit has been reached, each additional unexcused absence will be marked as a failure in recitation, and one or more excused absences will subject the student to a special preliminary examination before he can proceed to his regular examination.

After a number of unexcused absences equal to three weeks of recitations in any subject, the student will not be allowed to continue his work in that subject, but must take it with the succeeding class.

No excuse will be granted except for protracted illness, or for reasons in every way exceptional.

This rule does not apply to examinations, or to recitations just before or after any vacation or recess, or to any class as a whole at any time, and is not to be interpreted as remitting any part of the total work of the term.

**Chapel Absences.** Twelve absences without excuse will be allowed each term. All absences after the first twelve lower the standing at the rate of one unit for every two absences.

No absences will be excused except for protracted illness or for reasons in every way exceptional.

In the determination of a student's general standing marks for chapel attendance are counted as the equivalent of a one hour per week recitation. They affect the granting of scholarships and the selection of honor men.

**Conditions.** Students admitted with entrance conditions are required to remove them not later than the examination for the removal of conditions in the following March. Students who fail to meet this requirement are classed as irregular students. No student who has any conditions unsatisfied at the close of the first condition examination of the college year will be permitted to continue with his class without the express authorization of the Faculty. Conditions not removed at the next conditions ex-

amination held after their imposition must be made up in class at the first opportunity, and this work shall take precedence of the regular work in case of conflict in the schedule. No Senior who has failed to make up all his back work by the end of the second term of Senior year can be recommended for a degree, except by special vote of the Faculty.

Examinations for the removal of conditions occur on the first Saturday of the fall term, and on the first Saturday in December, March and May, as indicated in the College calendar. Registration for these examinations closes at 2:30 p. m. on the Wednesday next preceding the date set for each. A fee for each examination to be taken must be paid at the time of registration, at the College Office.

Students who have been excused from any term examination may be examined later, at the option of the instructor, but such examination cannot be postponed beyond the first condition examination. A failure to pass will be regarded as a condition which must be made up at the next following conditions examination.

A failure to report at any appointed examination will be regarded as a trial, unless previously excused.

No student will be reported "Not examined," unless excused in writing by the Dean. Without this excuse, students absent from term examinations will be reported as "Not sustained," or "Failed."

Any student permitted by the Faculty to anticipate or defer a term examination will be required to pay a fee for each special examination made necessary.

**Irregular Students.** Irregular Students have no class relation or class privilege; they are debarred from competition for prizes and from the attainment of special honors.

**Changes of Course.** Students are not permitted to pass from one course to another, or to take any studies out of their regular order, without the specific authorization of the Faculty.

The evidence that a student's continuance in college is resulting in no advantage to himself, or in harm to others, will occasion his separation from the institution.

**EXPENSES**

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Matriculation fee.....	\$ 5.00
Tuition, A. B., Ph. B. and B. S. courses, per term.....	25.00
Tuition, Engineering courses, per term.....	40.00
Graduate course in Electrical Engineering, per term.....	50.00
Room rent, per term, North College.....\$13.50 to	20.00
South College, per term.....	20.00
Incidental fee, for maintenance of grounds and public rooms, use of library, gymnasium, etc., per term.....	8.00

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Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.

amination held after their imposition must be made up in class at the first opportunity, and this work shall take precedence of the regular work in case of conflict in the schedule. No Senior who has failed to make up all his back work by the end of the second term of Senior year can be recommended for a degree, except by special vote of the Faculty.

Examinations for the removal of conditions occur on the first Saturday of the fall term, and on the first Saturday in December, March and May, as indicated in the College calendar. Registration for these examinations closes at 2:30 p. m. on the Wednesday next preceding the first of the above mentioned dates.

It is the custom of the student body to levy an annual campus tax of ten dollars, five dollars of which is payable at the beginning of the fall term, three dollars at the beginning of the winter term, and two dollars at the beginning of the spring term. This money is used for the support of the different branches of athletics consisting at present (1905-06) of foot ball,\* base ball and track.

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\*For the year 1906, foot ball has been abolished, although the substitute therefor has not yet been determined.— March 1st.

Students are not permitted to pass from one course to another, or to take any studies out of their regular order, without the specific authorization of the Faculty.

The evidence that a student's continuance in college is resulting in no advantage to himself, or in harm to others, will occasion his separation from the institution.

## EXPENSES

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Graduate course in Electrical Engineering, per term.....	50.00
Room rent, per term, North College.....	\$13.50 to 20.00
South College, per term.....	20.00
Incidental fee, for maintenance of grounds and public rooms, use of library, gymnasium, etc., per term.....	8.00
Graduation fee, including diploma.....	15.00
Chemical laboratory fees:	
Required course, No. 1 or No. 1a, per term.....	8.00
Required course, No. 2, in Civil, Sanitary and Elec- trical Engineering, Junior year.....	15.00
Required course, No. 5, in Sanitary Engineering, Senior year .....	15.00
Elective courses, No. 2, No. 3 or No. 4, per term.....	15.00
Electrical Engineering laboratory fee, per term....	\$2.00 to 10.00
Biological laboratory fees:	
Required course, No. 1, per term.....	2.00
Required course, No. 5, per term.....	3.00
Elective courses, No. 2 or No. 3, per term.....	6.00
Physical laboratory fees:	
Required course, No. 2, per term.....	4.00
Elective course, No. 1a, per term.....	5.00
Conditions examination fee.....	2.00
Fee for certificate of work done.....	2.00
Fee for certificate of graduation.....	1.00

Students who take part of their Senior year's work at the Albany Medical College, as provided on page 65, are charged \$125 for the year's tuition, \$50 to be paid to the Treasurer of Union College and \$75 to the Treasurer of the Albany Medical College.

Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.



No deductions are made because of absence from college.

No part of a term bill will be refunded for any cause.

Damage done by students to College property will be charged to their account.

No degree, certificate or dismissal will be given to any student until his bills are paid.

Board can be procured for \$3 to \$4 a week. The total expense of tuition, room, text-books, board, lights, washing, etc., during the three terms is from \$300 to \$400.

### College Rooms

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The College has two steam heated dormitories, accommodating ninety students. Most of the rooms are arranged in suites of two, and all are unfurnished; they are rented at prices varying from \$40.50 to \$60.00 per year for each student occupying a room. The rooms are cared for by competent persons, employed and paid by the College. No room is secured until a lease is signed and filed in the College Office. A student must occupy the room for which he signs, as transfers are not allowed. Each occupant of a College room will be held responsible for any damage done to the room. Students about to enter College who wish rooms in the dormitories should make early application to Charles B. Pond, Assistant Treasurer. On application, a list of the rooms, giving location and price, will be furnished. It is very desirable that students about to enter College should secure their own room-mates before the College year opens. When this is not done the men will be located in the order of application. At the end of the College year students giving up their rooms for any reason whatsoever must remove all furniture and property from their rooms not later than the Saturday following Commencement Day, as after this time the dormitories will be closed until the Saturday before the first registration day of the fall term. The dormitories will also be closed during the Christmas recess.

Students leaving property in their rooms during the vacations do so at their own risk.

## SCHOLARSHIPS

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Funds given especially for this purpose enable the College to offer aid to a number of students each year, as follows:

### General Scholarships

**Available for students in the A. B., Ph. B. and B. S. courses**

Scholarships covering a part or the whole of tuition charges are granted to students upon the following conditions:

1. The declaration of a purpose to remain in Union College until graduation. (Credentials necessary for admission to another college will not be given to any scholarship student until he has repaid to the college treasury the full amount of scholarship aid received.)

2. An acknowledgment that the aid received is regarded as a debt of honor, to be paid as soon as possible after leaving college.

3. The presentation of satisfactory evidence of financial need.

Scholarship aid will be withdrawn temporarily upon the failure of the student to be sustained in any subject, or upon his failure to maintain an average grade of eighty per cent. in the studies of any term, and after it has been withdrawn for three successive terms it will not be renewed.

Any serious breach of college discipline, evidence of moral delinquency, or repeated unnecessary expenditures will also result in the withdrawal of scholarship aid.

Application blanks will be provided by the President or Dean upon request.

### John David Wolfe Memorial Scholarships

The income of a Fund of Fifty Thousand Dollars established by the generosity of Miss Catharine Lorillard Wolfe is designed to aid students from the Southern States.

The scholarships are governed by the conditions named above.

Application blanks will be provided by the President or Dean upon request.

**Levi Parsons Scholarships**

A generous benefaction by the late Hon. Levi Parsons, of Gloversville, N. Y., maintains several scholarships in each class, yielding about one hundred and fifty dollars a year, each; this provides for tuition and a money payment each term.

Among applicants, preference is given:

First, to blood relatives of the founder, bearing his name and living in the county of Fulton, Montgomery or Hamilton, in the State of New York, and especially to those bearing his name and living in Gloversville or Johnstown, Fulton County.

Second, to applicants living in the following places, according to the following order:

1. The city of Gloversville, Fulton County.
2. The city of Johnstown.
3. The township of Johnstown.
4. The county of Fulton.
5. The adjoining counties of Montgomery and Hamilton.
6. To blood relatives living in any other part of the United States.

Nomination to scholarships is made by the Board of Directors of the Gloversville Free Library; and the nominees must pass satisfactory examinations at the College. Applications are received by the Directors of the Gloversville Free Library, Gloversville, N. Y.

These scholarships are governed by the conditions named on page 115.

**Thomas Armstrong Scholarships**

The late Thomas Armstrong of Plattsburgh, N. Y., provided for the grant of scholarships to residents of Clinton County, sons of practical farmers. Nominations to these scholarships are made by the Board of Supervisors of Clinton County, and the yearly value of each scholarship is not to exceed two hundred dollars.

**R. C. Alexander Prize Scholarship**

The sum of four thousand dollars has been given in memory of the late Robert Carter Alexander, of the class of 1880, and a life trustee of the College, to be devoted to the establishment of a scholarship for the encouragement of classical studies.

The income of this fund, amounting to two hundred dollars per year, will be awarded as a prize scholarship, upon the following conditions:

**Conditions****governing the award of the R. C. Alexander Prize Scholarship**

1. Candidates must be students in the Classical course, and of approved moral character.
2. They must be free from conditions, and must have obtained an average of at least eighty per cent. in the studies of the first two terms of the Freshman year.
3. They must pass successfully a special examination at the close of the Freshman year in each of the following subjects: Latin, Greek, Mathematics, English Composition, and either French or German. These examinations will be based upon the work of the Freshman year.
4. The award will be made to the candidate obtaining the highest general average in these examinations and in all the previous work of his college course.\*
5. The Prize Scholarship will be forfeited upon evidence of moral delinquency, or upon failure to maintain an average grade of ninety per cent. in the work of any subsequent term. The scholarship, once lost, cannot be regained, but will be awarded, upon the above conditions, to a student in the next entering class.
6. All questions pertaining to the administration of this scholarship will be determined by a committee composed of the President of the College, the Chairman of the Scholarship Committee of the Faculty, and a member of the Board of Trustees.

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\*This scholarship is now held by Harry Cook, of the class of 1906, and will next be awarded to a member of the present freshman class.

## PRIZES

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### Blatchford Oratorical Medals

The Hon. Richard M. Blatchford, LL. D., of New York city, founded oratorical prizes, consisting of two gold medals of the value of the interest on \$1,000, which are given to the two members of the graduating class who deliver at Commencement the best orations, "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals are awarded by a committee appointed by the Trustees, and are presented at the close of the exercises.

### Warner Prize

The Hon. Horatio G. Warner, LL. D., of Rochester, N. Y., founded an annual prize, consisting of silver plate of the value of \$28, to be presented at Commencement to the "graduate of Union College, Classical course, who shall reach the highest standing in the performance of collegiate duties, and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize is awarded by the Faculty.

### Ingham Prize

The Hon. Albert C. Ingham, LL. D., of Meridian, N. Y., founded an annual prize of the interest on \$1,000 (in the form of plate, or medal, or money, or both medal and money, as preferred), to be awarded at Commencement to that Senior connected with the College for not less than two years who shall offer the best essay on one of two assigned subjects in English Literature or History.

The essay must be typewritten, and must contain not less than 4,000 nor more than 4,500 words. Its signature (fictitious) and the writer's real name must be enclosed in a sealed envelope; the signature and the name of the prize being given on the outside. The essay, with the note, must be presented by noon on the fifteenth day of May.

**Allen Essay Prizes**

The Hon. William F. Allen, LL. D., of Oswego, N. Y., established a fund of \$1,000, the interest of which is devoted to prizes for the best three essays on any subject, submitted by members of the Senior class.

The essay must be typewritten, and must contain not less than 2,500 nor more than 3,000 words, and must be signed and presented (with note, as in the case of the Ingham Essay) by noon on May 15th. The prizes are awarded at Commencement.

**The Rankine Prize for Extemporaneous Speaking**

A prize of \$50 in money is awarded to that member of the College who shall deliver the best extemporaneous speech at a public competition to be held in Commencement week in each year. The award is made by a committee, appointed by the donor, and is based on the following considerations: (1) The appropriateness and correctness of the subject matter; (2) the logical force of the argument; (3) the excellence of the style; (4) the grace and effectiveness of the delivery. All students in regular standing are eligible. The number of competitors is, however, limited to ten.

**Oratorical Prizes**

Prizes are presented at Commencement to the two Juniors and the two Sophomores who deliver the orations best in composition and delivery on the occasion of Prize Speaking in Commencement week. Four Juniors and four Sophomores are selected for this competition by a committee of the Faculty on the fifteenth of April. Candidates must be in full standing on appearance before the committee.

**Allison-Foote Prize**

Founded by George F. Allison, of New York city, and Wallace T. Foote, of Port Henry, N. Y., for the encouragement of debate in the Literary Societies. The prize consists of \$100 in cash, and is to be awarded as the result of a public competition between representatives of the Adelpic and Philomathean Literary Soci-



eties. Fifty dollars will be awarded to the society presenting the strongest argument. The remaining \$50 will be awarded to the debater who makes the best single speech, regardless of his society relations. Contestants must have engaged in at least ten debates in their respective societies during the college year immediately preceding. All further details are to be left to the determination of a committee, consisting of the President, the Dean of the College, and the Professor of Rhetoric.

### **Daggett Prize**

In 1899 Miss E. Josephine Daggett bequeathed to Union College the sum of \$1,000, the interest of which is devoted to a prize for conduct and character, without respect to scholarship, to be given at Commencement to a Senior who shall have passed through a full course of four years at the College.

## **LAW SCHOOL SCHOLARSHIPS**

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Applicants for these scholarships, described below, must register at the College office by May 1st of Senior year.

### **John K. Porter Memorial Scholarships**

A fund given by Mrs. John K. Porter, in memory of her husband, is designed to assist students who, after graduating from college, pursue the study of law. The fund provides, at present, for three scholarships of ninety dollars each. The awards will be made at Commencement to Seniors chosen by the Faculty.

### **Gilbert M. Speir Memorial Scholarship**

A fund given by Mrs. Glover C. Arnold, in memory of her father, the late Judge Gilbert M. Speir, provides another scholarship for students of law who go from Union College to the Albany Law School, another department of Union University.

The sum of ninety dollars will be awarded at Commencement to the Senior chosen by the Faculty, the choice being made on the basis of excellence in historical studies.

## DEGREES AND HONORS

### Degrees

The degrees of the College are conferred in harmony with a resolution of the Board of Trustees, which says: "The successful completion of the Classical course [Course 1, page 64] shall entitle the student to the degree of Bachelor of Arts; of the Latin-Scientific course [Course 2, page 64] to the degree of Bachelor of Philosophy; of the Scientific course [Course 3, page 64] to the degree of Bachelor of Science; of one of the Engineering courses [Courses 4, 5, 6, pages 64 and 65] to the degree of Bachelor of Engineering; of the Graduate course in general or in Sanitary Engineering [Course 7, page 65] to the degree of Master of Civil Engineering; of the Graduate course in Electrical Engineering [Course 8, page 65] to the degree of Master of Electrical Engineering." The candidate for a degree must have entered college before the close of the first Senior term, must have paid all dues to the College Treasurer, and returned all books borrowed from the Library. He must also attend the conferring of Degrees, or be expressly excused therefrom.

The degree of Master of Arts or of Master of Science will be given to graduates of Union College who have been registered as candidates for the degree not less than two years, have completed definite courses of advanced study in two departments, and have submitted a satisfactory thesis and passed satisfactory examinations. The total amount of work done is intended to be the equivalent of one year of resident study.

A year of resident study in any non-professional graduate school, approved at the time of registration by the two departments concerned, will be accepted instead of the two years' study above mentioned on fulfilment of the same conditions regarding thesis and examinations.

Each candidate for this degree must register his name, address, and the two departments chosen, with the Dean of the College not later than the fifteenth of October of the year for which he desires registration.

The thesis must be presented to the Dean by May 1st for submission to the Faculty in time to provide for all necessary examinations before commencement.

A fee of \$20 is charged, which covers examinations and diploma; of this amount \$10 is payable at the time of registration and \$10 at the time of the final examinations.

### Honors

All commencement prizes are limited to A. B., Ph. B., or B. S. students who have entered at or before the beginning of the Senior year, and who are in full standing at the close of the second term; and to Engineering students entered likewise and in full standing at the close of the second term, in both the Engineering course and the English department of the B. S. or Ph. B. course.

### Commencement Appointments

These honors are assigned to ten Seniors on the basis of scholarship, as stated under Standing, page 110. Provisional appointments are made at the close of the second term Senior, and become final if those who receive them retain the same relative rank to the end of their course. Under present regulations, no other persons can become competitors for the Blatchford Oratorical Medals.

Seniors not in full standing at the close of the second term shall be considered ineligible to a Commencement appointment.

Places gained as the result of the third term's work shall be on the excused list, unless ordered otherwise by special vote of the Faculty.

### The Valedictory

This honor is awarded to the Senior of highest standing among the ten receiving Commencement appointments.

### Special Honors

Special Honors are also given at graduation in each of the following subjects: Greek, Latin, English Language, English Literature, French, German, Mathematics, Physics, Chemistry,

Biology, Economics, History, Sociology and Philosophy. The work required in each case will be equivalent of three terms of classroom work of two hours per week each, and will be outside of the prescribed or elective courses. The candidate for Special Honors must apply to the head of the department in which he proposes to take Honors not later than the first Monday of the Spring term of the Junior year. He must attain in all the studies of the department in which he tries for Honors a rank of not less than ninety per cent. of the maximum. The evidence that he has successfully completed the extra course prescribed for him must be submitted not later than June 1st of the Senior year to the Faculty, who shall decide in each case whether the work done is worthy of an Honor. The Honors attained are stated in the diploma, and the names of the students who take Honors are printed on the Commencement programme.

**DEGREES CONFERRED**  
 AT THE  
 ONE HUNDRED AND NINTH ANNUAL  
 COMMENCEMENT

June 14, 1905

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**HONORARY**

**LL. D.**

EDGAR M. CULLEN.....Brooklyn, N. Y.  
 CHARLES CUTHBERT HALL.....New York, N. Y.  
 RICHARD D. HARLAN<sup>1</sup>.....Lake Forest, Ill.

**D. D.**

STANLEY DAY JEWELL.....Butler, Mo.  
 GEORGE R. LUNN.....Schenectady.  
 JAMES B. RODGERS.....Manila, P. I.

**LITT. D.**

ELIZABETH MARSH .....Bryn Mawr, Pa.

**Sc. D.**

EDGAR S. BARNEY<sup>1</sup>.....New York, N. Y.  
 OLIN H. LANDRETH.....Schenectady.

**A. B.**

HENRY EASSON, as of the class of 1870. Beavers Falls, Pa.

**IN COURSE**

**A. M.**

GORDON EMMONS VAN LOON.....Class of 1903.

**M. E. E.**

TRINGAD K. EVANS.....Wales.  
 AUGUST H. KRUESI.....Class of 1898.

**A. B.**

SAMUEL D. PALMER, as of the class of  
 1904 .....Ogdensburgh.

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<sup>1</sup> Conferred at Commencement, 1904.

## CLASS OF 1905

## A. B.

JOHN FRANCIS BRADLEY.....	Troy.
THOMAS EARL MCGUIRK.....	Albany.
FREDERIC CURTIS PATTON.....	Rensselaer
MORRIS THOMAS RAYMOND.....	Schenectady.

## Ph. B.

ERNEST JUDSON ELLENWOOD.....	Dannemora.
GEORGE MYERS ELMENDORF.....	Coeymans Hollow.
LOUIS CHRISLER HART.....	Albany.
FRANK IRA LOSEE.....	Fergusonville.
JAMES ROSE STEVENS, JR.....	Cohoes.
ALEXANDER J. THOMSON.....	Schenectady.

## B. S.

THOMAS MILTON HOLMES.....	Albany.
CHARLES MALCOLM MCGREGOR.....	Gloversville.

## B. E.

CLARENCE STILMAN ARMS.....	Sidney.
ELVIN JAY BECKER.....	Middleburgh.
JAMES HANNAH CUNNINGHAM.....	Schenectady.
FRANK THORBURN FORSTER.....	Nyack.
NEIL CUMMINGS HOLDREDGE.....	West Burlington.
WILLIAM THEODORE HUNT.....	Otego.
ERIC TURE KING.....	Rosebank.
MORLAND KING.....	Brooklyn.
HERMAN CARL KLUGE.....	Elmira.
ROSS S. MCCLELLAN.....	Tacoma, Wash.
WILLIAM ORSON MORSE.....	Camden.
JOHN ROWLAND NOWELL.....	Anderson, S. C.
LEROY LEE ODELL.....	Poughkeepsie.
AQUILES RODRIGUEZ.....	Nuevitas, Cuba.
EDWARD GAILLARD SIMONS.....	Eutawville, S. C.
KARL FREDERICK WEST.....	Caldwell.



## AWARDS

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### Valedictory

FRANK IRA LOSEE.....Fergusonville

### Commencement Orations

ERNEST JUDSON ELLENWOOD.....Dannemora  
 GEORGE MYERS ELMENDORF.....Coeymans Hollow  
 THOMAS MILTON HOLMES.....Albany  
 ERIC TURE KING.....Rosebank  
 MORLAND KING.....Brooklyn  
 MORRIS THOMAS RAYMOND.....Schenectady

### Engineering Theses

JAMES HANNAH CUNNINGHAM.....Schenectady  
 FRANK THORBURN FORSTER.....Nyack  
 NEIL CUMMINGS HOLDREDGE.....West Burlington  
 ERIC TURE KING.....Rosebank  
 MORLAND KING .....Brooklyn  
 KARL FREDERICK WEST.....Caldwell

### Special Honors

In Latin.....	{	GEORGE MYERS ELMENDORF FRANK IRA LOSEE
In German .....	MORRIS THOMAS RAYMOND	
In History.....	{	GEORGE MYERS ELMENDORF FRANK IRA LOSEE JAMES ROSE STEVENS

### Warner Prize

For Seniors

MORRIS THOMAS RAYMOND

### Blatchford Oratorical Medals

For Seniors

1st. MORLAND KING  
 2nd. MORRIS THOMAS RAYMOND

Honorable Mention.

THOMAS MILTON HOLMES

**Ingham Prize**

For Seniors

FRANK IRA LOSEE

**Allen Essay Prizes**

For Seniors

1st. EDMUND GAILLARD SIMONS

2nd. GEORGE MYERS ELMENDORF

3d. ALEXANDER J. THOMSON

**Daggett Prize**

KARL FREDERICK WEST

**Holleran Prize**

To the Senior Engineer of Highest Standing

ERIC TURE KING

**Junior Oratorical Prizes**

1st. PHILIP LUKE CLASSEN

2nd. CHARLES NEWMAN WALDRON

**Sophomore Oratorical Prizes**

1st. RICHARD SYLVESTER DILLON, JR.

2nd. DUDLEY TOLL HILL

**Allison-Foote Prizes**

Won by the Philomathean Society

and

LEON RAY LEWIS

Class of 1906

**Prize Essay in Engineering**

Won by

LESLIE GILBERT HOLLERAN

Class of 1906

**R. C. Alexander Prize Scholarship**

HARRY COOK

Class of 1906

**John K. Porter Memorial Scholarships**

THOMAS EARL MCGUIRK

ALEXANDER J. THOMSON

**Gilbert M. Speir Memorial Scholarship**

ERNEST JUDSON ELLENWOOD

**The Rankine Prize for Extemporaneous Speaking**

BYRON WILLIAM REED

**Sigma Xi**

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ERIC TURE KING

MORLAND KING

FRANK IRA LOSEE

KARL FREDERICK WEST

SCHOOL OF ENGINEERING

UNION COLLEGE

SCHENECTADY, N. Y.

**FACULTY**

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Professor of Civil Engineering

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Dean and Professor of History and Sociology

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Lecturer on Current History

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FRANK COE BARNES, A. M., PH. D.  
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Assistant Professor of Engineering and Mathematics

ELMER E. F. CREIGHTON, B. S., E. E.  
Assistant Professor of Electrical Engineering

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Instructor in Mathematics

SAMUEL E. WEBER, B. S. in M. E.  
Instructor in Civil Engineering

JOHN W. HUGHES, B. S. in C. E.  
Instructor in Civil Engineering

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Instructor in Electrical Engineering

WALTER M. CURTIS, S. B.  
Instructor in Mechanical Engineering

CHARLES H. McCULLOCH, B. E.  
Instructor in Civil Engineering

DAVID CHARLES CALDWELL, A. B.  
Assistant in Chemistry



## INTRODUCTORY

The charter of Union University brings together under one corporate name and administration Union College, located at Schenectady, N. Y., and the Law School, the Medical College, the Dudley Observatory and the College of Pharmacy, all located at Albany, N. Y.

The Engineering School forms a part of Union College. Its connection with the regular college courses and with the other members of the university group is considered an advantage, as it has a broadening influence and furnishes opportunities for general culture not usually available in a purely technical school.

## HISTORICAL

When Union College was chartered, in February, 1795, the only American colleges west of the Hudson River were William and Mary, Princeton, Hampden-Sidney, Rutgers and Dickenson. These, as well as the New England colleges, were all denominational; Union was the first strictly non-sectarian American college, and its name was inspired in part by this novel characteristic. The first full professorship in natural science in an American college was founded at Union, and it is a matter of special scientific interest that Prof. F. R. Hassler was called from this chair in 1811 to establish the U. S. Coast Survey.

The engineering school of Union College is one of the oldest technical schools of the country. Founded in 1845 with Prof. William M. Gillespie at its head, it at once took high rank, and for many years was one of the few engineering schools in America. From the first it appears to have been the evident policy of the school to adapt the thorough training of L'École des Ponts et Chaussées, of Paris, France, where Prof. Gillespie had finished his technical education, to the demands of professional practice in a vigorous new country, where resources and opportunities were abundant, and where capital and professional precedent were wanting. From the characteristic tendencies impressed on the school at its foundation it has never departed, although it has endeavored to keep pace with the development in American tech-

nical education and with the increased demands on professional training. For many years Civil Engineering only was taught; then, as the principles of modern sanitary science came to be better understood and the possibilities of their further development and their utilization as life-saving agencies were discerned, a course in Sanitary Engineering was established; and more recently a course in Electrical Engineering, just now being extended, was added.

During its whole history the school of engineering at Union has stood for broad, fundamental training rather than for narrow specialization, and during recent years, since its advanced entrance requirements have made room in the course, increased time and attention have been given to culture studies and to a larger proportion of academic training.

## DESCRIPTIVE

**Local Advantages.** Schenectady is a peculiarly favorable location for an engineering school. The city is on the Mohawk River, and is intersected by several steam railroads, a number of inter-urban electric trolley lines and the Erie Canal, furnishing many bridges and other engineering works. At Schenectady are also located the works of the General Electric Company and of the American Locomotive Company, each an extensive and leading plant in its respective line. Among other interesting engineering features may be mentioned the city grade-crossings improvement now just inaugurated at a cost of a million dollars, and the city waterworks, which contain in their outfit a system of ground-water wells and a recently installed set of electrically-driven multiple-stage centrifugal pumps, of twenty million gallons daily capacity. The neighboring cities of Albany, Troy and Cohoes, as well as the surrounding territory, offer numerous examples of good engineering and many features of value as aids in engineering training. Among these may be mentioned the Scientific Departments of the State Government at Albany, including the headquarters of the State Engineer's Department and of the new Barge Canal; the State Library; the Albany City Water Filtration Plant; at Troy the Burden Iron Works; the Steel Plant; the

Gurley Engineering Instrument Manufactory; at Watervliet the United States Arsenal and Gun Factory; the Water Power Developments and Electric Power Transmission Plants at Mechanicville and Spier Falls; the Hydraulic Cement Works at Glens Falls and at Howe's Cave; and the Modern Sewage Disposal System at Saratoga Springs. It is expected that the proposed new barge canal will pass the Cohoes Falls by a flight of locks and will pass Schenectady by a system of locks and dams in the Mohawk River, calling for extensive and interesting engineering operations. All these sources of aid are utilized in the work of the school.

**Alternate Courses of Study.** Three courses in engineering are offered, each extending through four years: (1) A course in general engineering, which is intended to give the basis of a broad engineering education, including the fundamental principles underlying all special branches of the profession; (2) A course in sanitary engineering which differs from the general engineering course by substituting special work in sanitary subjects for some of the general engineering studies; and (3) a course in electrical engineering, in which the last two years are devoted to essentially mechanical and electrical engineering subjects.

These three courses are identical during the first two years, the sanitary course differing slightly from the general during the last two years, while the electrical course in its last two years differs widely from the other courses.

The degree of Bachelor of Engineering (B. E.) is given for the successful completion of any one of these courses.

The degrees of Master of Civil Engineering (M. C. E.) and of Master of Electrical Engineering (M. E. E.) are given on the satisfactory completion of one-year's graduate courses of study in Civil Engineering and in Electrical Engineering, respectively.

**General Education and Technical Training.** In the training of a young man for his professional work two distinct methods are open. One is to separate his professional work from his general educational training and to complete the latter before the former is commenced. This is the plan followed in the professional schools of theology, law and medicine. The other plan is, after

the student has reached a certain point in his studies, to have him carry forward at the same time his general education and his technical training. This plan is the one generally followed in engineering schools, as it has been found by engineering educators and professional engineers to yield better results in practice than the former plan. The point selected at which the technical training shall commence is the beginning of the college course, the four years time of which is divided between general studies and technical studies. In the Union College engineering courses the time allotted to the two divisions is about equal, though the two are carried on simultaneously, the general training receiving, however, more time in the early part of the course and less in the latter part.

## REQUIREMENTS FOR ADMISSION TO THE ENGINEERING SCHOOL

### COMMON TO ALL ENGINEERING COURSES

**General Conditions for Admission.** The general conditions governing admission to the Engineering School are stated in detail on page 66.

**Requirements for Examination.** Candidates for admission to the Freshman class in any of the Engineering courses are required to pass satisfactory examinations in, or present approved certificates covering the following subjects:

English Literature, Arithmetic, Algebra, Plane and Solid Geometry, Plane Trigonometry, Physics, German or French, History of the United States, Modern Geography, and Physiology, as given in detail on pages 67-74.

## EXPENSES, TERMS AND VACATIONS

For information regarding expenses, and terms and vacations, see pages 113, 114, and pages 7, 8, 9.

## STUDIES OF THE THREE COURSES

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### OUTLINE DESCRIPTION

The following is an outline of those studies which in general are common to the three courses, in General, Sanitary and Electrical Engineering. The studies which are peculiar to each are outlined under the separate departments.

Following the distinction between the two kinds of training above mentioned, the studies here outlined are arranged under the two heads of General Studies and Technical Studies.

### GENERAL STUDIES

**Mathematics.** To the engineer the subject of mathematics is valuable not only for its disciplinary training, but also for its practical applications and use. Both these features receive due consideration in the teaching of the subjects under this head.

The studies of this department include algebra (completed), spherical trigonometry, analytical geometry, descriptive geometry, differential and integral calculus. See also pages 90-92.

**Analytical Mechanics.** The subjects taught under this head are statics, dynamics, hydro-statics, hydro-dynamics, pneumatics. These studies form the foundation for the technical studies of applied mechanics, strength of materials and stresses in framed structures, all of which are fundamental to one of the chief divisions of an engineer's duties, namely, that of designing.

**Physics.** The instruction in physics comprises a series of lectures on experimental physics, followed later by classroom and laboratory work. Physical laboratory work is required of all engineering students. See also pages 93, 94.

**Chemistry.** General chemistry is taught by lectures, recitations and laboratory work during the Freshman and Sophomore years and laboratory work in qualitative analysis is continued through the first term of the Junior year. Sanitary engineering students



in addition to the above take chemical laboratory work during the first and second terms of the Senior year. See also pages 94-96.

**Astronomy.** The instruction in astronomy includes physical astronomy, spherical astronomy and the theory of astronomical instruments. These studies are preparatory to the work in astronomical surveying and geodesy given in the general engineering course. In the electrical engineering course the work is confined to descriptive astronomy.

**Biology.** Physiology is a required study in each of the three engineering courses. Structural botany is given in the general and sanitary courses, and bacteriology is given in the sanitary course. Structural botany includes the microscopic study of the vegetable cell, the tissues and the tissue-system of the higher plants, with special reference to the use of woods in the constructive arts. In bacteriology some of the common bacteria of water, air and soil are studied according to the methods of modern bacteriological work. The accompanying lectures treat of bacteria in regard to their place and role in nature and their relations to sanitary science. See also pages 97-99.

**Geology** (not required in the electrical engineering course). This work comprises a course in economic geology, which includes the general principles of geology and a discussion of the occurrence and distribution of minerals and mineral materials for construction in the United States. See also pages 97-99.

**English.** The instruction in English aims at a general acquaintance with English literature and a correct, clear and forcible use of the language. Rhetoric is studied throughout the Freshman year. In the first term a summary review of diction is given. In the second and third terms more attention is given to the development of thought by work upon kinds of composition and the paragraph. In the Sophomore year English literature as represented by the work of the essayists and by Shakespeare is studied. In the Senior year one of the required essays of each term will be



upon a technical subject prepared under the direction of the professor of Civil Engineering, the object being to give the engineering student practice in the preparation of clear, concise and systematic reports on engineering subjects. See also pages 83-85.

**Modern Languages.** All engineering students at the time of entrance must have had two years of either French or German. After entering they are required to pursue French and German each for one year. This will be advanced work for the language offered at entrance, and elementary work in the alternate language not offered. Some work in scientific French and scientific German is done during the latter part of the course. See also pages 78-83.

**Physiology and Physical Training.** See pages 99, 100.

### TECHNICAL STUDIES

The following technical subjects are included in each of the three engineering courses:

**Drawing and Descriptive Geometry.** The instruction in this work extends through the entire course. In the first term of the Freshman year the student is instructed in freehand drawing and in freehand lettering. In the second term he is instructed in the use of drawing instruments, in orthographic projections and in construction of geometrical problems and instrumental lettering. In the third term Freshman and first term Sophomore he is given practice in plotting surveys made in the field. Further instruction in topographical drawing follows in the first term of the Sophomore year. Descriptive geometry is begun in the second term Sophomore and, in addition to instruction in the theory, some of the most common applications in practice are taught by the use of practical problems. Schroeder's models and the Olivier models, as well as the models of intersections of the Paris Polytechnic School, are freely used. In the third term Sophomore instruction is given in shades, shadows and perspective and in the theories of oblique projections.

**Mensuration and Surveying.** This work is begun in the second term of the Freshman year by the study of pure and applied mensuration, together with the fundamental principles of error, precision and computations, illustrated by practice. In the third term the theory of surveying instruments and operations is taken up and illustrated by field practice with the chain, tape, compass, transit, level and rod. In the first term Sophomore topographical surveying is commenced and instruction and practice are given in the use of the various methods and instruments.

As a preliminary to instruction in each branch of surveying a thorough study of the instruments employed is made, treating their geometrical, optical and mechanical relations; their adjustments and use; and the determination of their instrumental constants, errors and limits of precision. The classes are divided into small sections and directed by the instructors. Office computations, plotting and mapping are made adjuncts of the field surveys.

**Applied Mechanics and Materials.** Applied mechanics is commenced in the first term of the Junior year, and comprises the extension of analytical mechanics and the development of the methods of graphical analysis with their applications to engineering problems, operations and constructions, particularly the treatment of stresses, strains, deflections and deformations in elastic materials and structures due to extraneous forces.

In conjunction with this work is given the study of the production, preparation, strength and physical properties of the various engineering materials, including timber, stones, cement and lime mortar, cast iron, wrought iron and structural steel. Practice in the engineering laboratory is an important adjunct to this study.

This entire division, properly correlated, becomes the foundation of all rational engineering design and construction.

**Engineering Law and Procedure.** During the first and second terms of the Freshman year and the third term of the Senior year a series of lectures is given on topics pertaining to the training and the qualifications of engineers, and to engineering practice. In the third term of the Senior year a course is given in the study

of the elements of the law and principles of procedure in contracts, agency, corporations, commercial and financial transactions and industrial accounting and of the law relating to land boundaries and titles, water courses and surveys.

**Voluntary Studies.** Any of the studies of the classical course or of the scientific course of the college may be taken by engineering students without extra charge.

**Final Examinations.** During the Senior year a series of final examinations will be held covering the more important subjects of the entire course. The list of subjects in which examinations are to be given during any term will be determined by the faculty.

**Theses.** Each candidate for graduation is required to present on or before the first Wednesday in June of his graduation year a satisfactory thesis on a subject that has been approved by the professors of Civil Engineering or of Electrical Engineering. This thesis must be original in its character and may be either a design for some engineering structure or plant, process or operation, or an independent investigation of some principle, problem or matter of engineering importance. Reviews or copies of existing structures, plants or processes, unless of special educational value or involving original investigation, will not be approved as subjects. This thesis is to be in a form prescribed at the time of approval of the subject, and is to be bound for deposit in the library of the engineering school, and must be presented in this shape on or before the stipulated date. The subjects, with outlines of the proposed treatment, must be submitted for approval not later than January 1st of the graduation year, and the work on the theses must be presented for inspection and criticism of the professor in charge of the department at intervals during progress.

### **Library**

The students have the use of the College and Society Libraries. The former contains the Engineering and Scientific Library of the late Professor Gillespie and other valuable technical collections. See pages 100-101.

## GENERAL ENGINEERING DEPARTMENT

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**Two Alternate Courses.** Two alternate courses or options are offered in general engineering, either of which may be selected by general engineering students at the beginning of the Junior year, and each of which extends through the Junior and Senior years. The first of these alternate courses, designated as "Option A," offers a broad, fundamental, general engineering training such as a thoroughly trained engineer should have before specializing in any of the branches of the profession. The other alternate course, designated as "Option B," while in the main identical with the former, differs from it by omitting some of the more technical subjects, such as stereotomy, kinematics, least squares, sewerage, geodesy and field astronomy, and by substituting therefor sociology, the elements of law, political science and international law, the principles of finance and financial operations, the principles of business management and accounting, and additional work in history and in engineering law and procedure. The object of this alternate course is to offer to engineering students an opportunity to better qualify themselves for engineering positions of an executive or administrative character.

The details of these two optional courses will be found later on pages 163 and 164.

In addition to the studies common to all engineering courses previously described on page 136, the following subjects are included in the general engineering course. Unless otherwise stated, the following studies are required in each of the two alternate courses in General Engineering:

**Drawing and Descriptive Geometry (continued).** In the Junior year work in drawing includes machine drawing and the solution of problems in graphical analysis. In the Senior year the subject includes the work in engineering design and construction of the last two terms, and comprises a large amount of structural drawing in the development of the designs of engineering structures. A course in stereotomy and stone cutting is given in the first

term Senior, with drawings from the stereotomy models of the Paris Polytechnic School. Practice in blue printing is made a part of these courses.

**Surveying (continued).** Railroad surveying is treated in the third term of the Junior year, and the students are given exercises in the proper field operations on railroad surveys, office and field location and staking out work for construction. The subject of railroad construction and equipment is not treated until the first term of the Senior year.

**Geodesy and Astronomical Surveying.** This course is given in the third term of the Senior year, and comprises a discussion of the figure of the earth, triangulation systems, base lines, geodetic observations, reductions and adjustments, determination of latitude, time and azimuth, transformation of co-ordinates and map projections.

When feasible about three weeks of uninterrupted field and office practice will be devoted to this subject in the Junior or in the Senior year.

**Engineering Design.** The course in applied mechanics and materials prepares the student to undertake the study of engineering design proper, which is pursued throughout the Senior year; an important feature of this course is the work in bridges, railroads and water-power developments, architectural engineering, etc. The exercises in this line of work are, as far as possible, chosen from professional practice, and the student is expected to carry out, from assigned data and conditions, the preliminary study, determinations of stresses, types, dimensions and details, and to turn in the results in the form of working drawings, diagrams and memoirs. The department possesses a large collection of drawings and photographs of representative engineering structures from which students can form correct ideas of modern practice in the designing of details and in the methods followed on works of this class.



**Water.** The subject of water is considered from several stand-points. In the first term Junior is given a laboratory course in chemistry, followed by a course in water analysis. In the third term Junior is given a course in hydraulics, followed in the Senior year by a fuller development of the subject as applied to rainfall, run-off and storage of water, in relation both to water power and to potable water supplies. This course is accompanied by a study of the sanitary aspects of the subject of water supply and its preservation from contamination. An outline study is also made of pumping engines.

**Highways.** The study of highways in the first term of the Junior year comprises a consideration of the highway as an element in the transportation system of the State, the principles of its economic location and proper construction, a study of the various modes of construction and the materials employed, its proper maintenance and systems of highway laws and administration.

As a preliminary to the study of highway location as well as of railroad and route surveying, some consideration is given to the principles and fundamental laws of topographical types and forms and their relation to the various modes of earth sculpture.

**Streets and Pavements.** A study of the methods of laying out and grading streets and pavements and of the various street accessories, paving methods and materials and their treatment, with special reference to their economic and sanitary aspects, is also given during the first term of the Junior year.

**Motors and Motive Power.** Following the work in thermodynamics and hydraulics of the third term of the Junior year an outline course in motors and motive power is given in the first and second terms of the Senior year, comprising a study of the sources of demand and supply of power, steam-boilers, steam-engines, steam turbines, water-wheels and turbines, gas-engines, electric motors and transmission of power by shafting, belting, rope-drives, compressed air and electricity.



**History and Economics.** American history throughout the Junior year and economics during the first term of the Senior year are required of all general engineering students.

**Sociology, Political Science and International Law.** General engineering students who elect "Option B" in engineering administration are required to have sociology during the last two terms of the Junior year, political science during the first two terms of the Senior year, and international law during the last term of the Senior year.

**Principles of Finance, Business, Accounting.** General engineering students who elect "Option B" are given instruction in the principles of finance and financial operations, the principles of business and of industrial organization, and the principles of accounting and of cost-keeping during the second and third terms of the Senior year.

### **Instruments and Apparatus**

The department is supplied with field instruments of the best description, comprising a large theodolite, suitable for refined geodetic operations, transits, surveyors' compasses, prismatic compasses, Burnier's compass, solar compass, Y levels, the levels of Troughton, Egault, Lenoir and Burnier; plane tables, sextant, octant, mountain barometers, aneroid barometer and a marine chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie has been purchased for the Engineering School.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important:

**The Olivier Collection.** This consists of about fifty models, representing the most important and complicated ruled surfaces of Descriptive Geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved,

to which are attached silk threads representing the elements or successive positions of the generatrices of the surfaces. Each of these threads has a weight suspended by it, so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads, still stretched straight by the weights in every position they may take; so that the forms and natures of the surface which they constitute are continually changing, while they always remain ruled surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid, etc.

These models were invented by the late Theodore Olivier while Professor of Descriptive Geometry at the Conservatoire des Arts et Métiers, in Paris. One set of them is now deposited there, and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands, and, after his death, in 1853, retained by his widow till bought of her by Professor Gillespie, in 1855. It is more complete than that in the Paris Conservatoire. It may be worth noticing that the silver plates on the boxes, reading "*Invente par Theodore Olivier*," etc., were added by Madame Olivier, at her own expense, after the purchase, as a tribute to the memory of her husband, her own words being, "*Je tenais à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité.*"

Professor Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones, etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal; models illustrating Shades and Shadows.

**Stone Cutting Models** (twenty) in plaster, selected from those of L'École Polytechnique of Paris.

Professor Bardin's models (ten) in plaster, of OBLIQUE ARCHES. Groined and cloistered arch models (ten in wood and plaster. Models of structures in stone, consisting of bridges, culverts, etc.

Winding-stair models in wood and plaster. Full sized models of voussoirs and skew-backs of an oblique arch.

**Models in Topography.** French and German plaster models, giving all the different forms of ground, accompanied by topographical drawings, showing how to represent these forms by contour lines; hatchings and shades from vertical and oblique light; models and maps in colored topography; a large model of Mount Ceniz Pass, showing the wagon road and contour lines.

**Architectural Models.** Models of the five orders of Architecture from L'École des Beaux Arts, Paris; portals; stairs; roofs; walls; buttresses; domes, etc.

**Engineering Models.** Schroeder's models of joints, brick bonds, etc.; spur wheels; bevel wheels; cranes; pile drivers; various forms of water-wheels; pumps; cylinders; valves; eccentrics, etc.; steam engines.

Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full sized model of the liquid vein measured by Poncelet and Lesbros.

Models of bridges of various systems, comprising truss, suspension, tubular and arch bridges; Doyne's Dynamometer Bridge Models showing, by means of dynamometer, strains at different points; models of roof trusses, arranged for using the dynamometer to show the different stresses.

Models of fortifications, illustrating Vauban's system; shot, shell, etc.

Models of culverts, piers, abutments, culvert heads, wing walls, rail sections, etc.

**Maps, Drawings, Etc.** This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections; about fifty thousand engravings, lithographs, photographs and detail drawings of engineering and architectural structures; working drawings of machines, bridges, buildings, etc.

**Physical Apparatus.** To illustrate the lectures in Physics, the college has an extensive collection of apparatus. This has been secured largely from foreign makers and includes special pieces of apparatus constructed under the direction of the late Prof. Foster, besides sets of apparatus of standard patterns by Koenig, Doboseq, Ruhmkorff, and others.

**In Mineralogy.** The Wheatley collection contains nearly 4,000 specimens of minerals, the result of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are, without exception, open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy. Among the rare and valuable specimens are those of Anglesite, Cerusite, Mimetite and Calcuprite, which in American specimens are equaled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blow-pipe examination.

**In Metallurgy.** The College possesses a suite of ores of the useful metals, comprising over 1,000 specimens. These have been arranged to illustrate their mode of occurrence and geographical distribution. In addition are the fluxes, fuels, etc., used in obtaining the metals from the ores, together with the slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces, etc.; also suites of specimens of wood, charcoal, mineral coal, peat, etc., for physical inspection; also specimens of most of the useful alloys.

**In Chemistry.** The chemical laboratory is furnished with tile-top desks and lockers, and all the modern apparatus necessary for work in general chemistry and qualitative and quantitative analysis. Ample hoods occupy one side of the laboratory, where the student may work with the disagreeable and poisonous gases. In the private laboratory of the professor of chemistry provision

is made for any students who may desire to pursue advanced courses, either in volumetric analysis, water and milk analysis, organic chemistry, or any special work in connection with courses of other departments.

A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids; the crude products themselves and the materials used in the manufacture of the alkalis, soaps, matches, black lead, candles, petroleum products; linseed, olive, castor, cottonseed and other oils; paper, porcelain, glass, fire and building brick, mortar and cements, beet and cane sugars, white lead and other paints, etc., etc., form a part of the permanent collections of the department.

## SANITARY ENGINEERING DEPARTMENT

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**General Considerations.** The extensive development of sanitary biology during recent years and the establishment on a firm, scientific basis of the germ-theory of disease have laid a secure foundation for the important specialty of sanitary engineering. Already the practical application of the principles in many lines of public utility, as well as in medicine and surgery, has resulted in a very marked decrease in the annual death rate. The most fruitful line of application of this recent and useful knowledge lies in the intelligent design, construction and operation of municipal public works and of systems of water supply, sewerage and drainage, heating and ventilation of private residences, schools, hotels, hospitals and other public institutions and buildings.

**General Scheme of the Course.** The course in sanitary engineering differs from the general engineering course by omitting the astronomical surveying, geodesy and railroad construction, and substituting therefor sanitary biology, heating and ventilation, house drainage and plumbing, sewage disposal, sanitary codes and laws, and an increase in the amount of chemistry and chemical laboratory work.



**Sanitary Conditions of Buildings.** In the first and third term Senior, respectively, are given courses in heating and ventilation and in house drainage and plumbing. The latter course will give special attention to the matter of water supply and of the removal of wastes from buildings in all situations, from the isolated country house to that in a thoroughly drained city.

**Sewerage and Drainage.** The study of the principles and practice of sewerage and sewage disposal is given during the last term of the Senior year. The fundamental sanitary and constructive principles will be developed and a comparative study of the various systems as well as of the details of construction and maintenance receive careful attention. A course of lectures in the third term Senior presents the principles upon which the laws touching the subject of the public health are based and the outlying principles which should govern the preparation of sanitary codes and regulations.

For special information regarding the Departments of General and Sanitary Engineering address

OLIN H. LANDRETH,  
Professor of Engineering, Schenectady, N. Y.

## **ELECTRICAL ENGINEERING DEPARTMENT**

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A course of instruction in Electrical Engineering was introduced in 1895, and in 1902 was re-organized and made into a separate department of the engineering school under the direction of Professor Charles P. Steinmetz, consulting engineer of the General Electric Company.

The course of studies offered by the Department of Electrical Engineering aims at a thorough and broad scientific education of the prospective engineer, rather than the specific training of a specialist. The instruction, therefore, consists of three classes of studies. The general culture studies furnish such training as is now considered essential for every educated man, as languages, literature, history, etc. Such instruction extends over a large



part of the first two years, and is then followed by a broad and general technical education, giving the student the fundamental principles and their application to all branches of engineering. Ultimately follows the specific instruction in Electrical Engineering, which, while it enables the student, after graduation, to enter the field of Electrical Engineering practice in the manufacturing or operating company or consulting engineer's office in a subordinate capacity only, has given him all the necessary requirements to gather in a few years' practice the knowledge needed for independent work of greater magnitude.

The instruction especially aims at a thorough understanding of the fundamental principles rather than a memorizing of numerous facts—that is, aims at quality, and not quantity—and as far as possible in all engineering instruction the subject is brought before the students in three different ways: by a theoretical lecture course with recitations, practical instruction in the electrical laboratory paralleling the lecture course, and, following after this, the application of the knowledge gained in lecture courses and laboratory to calculation and design in the drafting room. Finally, more independent work on the solution of engineering problems is undertaken by the students. These problems invariably require some research work; the systematic tabulation of the results with original conclusions constitute the graduating thesis. Throughout the technical course, by work in the laboratory, some familiarity with the apparatus is given to the students before the technical side is taken up in the lecture course, so that when approaching the theoretical studies of electrical phenomena or apparatus the student is already able to appreciate the practical value and importance of the subject with which the theoretical investigations deal.

Through the active interest which the General Electric Company takes in technical education, an arrangement has been effected between the College authorities and the officials of the company by which the students in the Junior and Senior classes are admitted to the company's works at regular scheduled times, under the direction of their instructor, with the privilege and opportunity of studying and inspecting the plant and operations and of being regularly instructed therein. The work has been

systematically arranged, and is given simultaneously with the corresponding class and laboratory work, to which it forms an important and valuable adjunct.

The active interest taken by the prominent engineers of the General Electric Company has made it possible to offer to the Junior and Senior classes a systematic lecture course on the different branches of Electrical Engineering, in which the lecture on each topic is delivered by the specialist who is the highest authority in this branch of Electrical Engineering.

### **List of Studies—Outline Description**

The following list of studies comprises only those subjects of the electrical engineering course which are not required in the other courses, and have, therefore, not yet been described in detail. All the culture studies and most of the general engineering and scientific studies are pursued in common with the students of other engineering branches. Beginning with the Junior year, however, the courses diverge. The electrical engineers take up a number of mechanical engineering subjects and continue them throughout the Junior and first part of the Senior year. In fact, during the Junior year the mechanical engineering work may be considered as constituting the major subject, though a considerable amount of time is also devoted to electrical engineering.

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The mechanical engineering subjects not previously described are:

**Hydraulics and Hydraulic Design.**

**Hydraulic Turbine.**

**Theory of the Steam Engine.**

**Steam Engine Design.**

**Thermodynamics, Gas Engine and Steam Turbine.**

Other general subjects given only to electrical engineering students are:

**Elements of Civil Engineering.** The work and methods of the civil engineer. This course is given to broaden the ideas of the student, thus enabling the electrical engineer to value properly the labors of his colleague in this allied department of the profession.

**Engineering Mathematics.** One lecture a week is given throughout the Junior and Senior years on the special branches of mathematics most employed in engineering work. It is recognized that mathematics is the foundation of all engineering, and a considerable part of the Freshman and Sophomore years is therefore devoted to the study of mathematics. In addition thereto this course is given specially to train the students in those particular branches of mathematics which are most frequently applied in electrical engineering, and so enable them to handle mathematics as a ready working tool in practical engineering problems. This course is given by Prof. Steinmetz, and in 1903-1904 covered the infinite series, its derivation and meaning; the trigonometric series; determination of maxima and minima; the fundamental differential equation of electrical engineering and its integral; empirical curves and their investigation, as the parabolic, exponential and logarithmic function.

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The electrical engineering studies include the following:

**Sophomore Electrical Laboratory.** The profession of electrical engineering requires men who, besides possessing the broad fundamental knowledge which must form the basis of every engineering work, are thoroughly familiar with the operation, characteristics, underlying principles, design and calculation of the various machines and appliances used in electrical work. The multiplicity of the applications of electrical energy at present is such that in order to cover the ground in the short time afforded by a four years' course special effort must be made to present the matter

in such form and manner as to secure to the student the greatest economy of time and energy.

To this end the student is made acquainted in his Sophomore year with the operation and general behavior of electrical machinery, so that when in the Junior year the exact theoretical and laboratory investigation of electrical apparatus is undertaken he may already have some knowledge of the nature, general features, purpose, etc., of his studies.

This preliminary work, which has been found to increase greatly the efficiency of the work done in the Junior year, consists in the handling and running of motors and generators, both direct and alternating current; the use of transformers; the study of arc lights of various constructions and systems and in general practice in the use of meters and measuring instruments. The practical construction of the machinery is also considered, and at regular intervals trips are made to the foundry, pattern shops, erecting shops and machine shops of the General Electric Company and of the American Locomotive Works.

**Direct Current Circuits and Apparatus.** After completing the electrical laboratory work of the Sophomore year students in electrical engineering devote a considerable part of the Junior year to the study of the fundamental principles of the subject. Direct current phenomena are studied first, as this part of the subject is somewhat simpler and is readily brought within the grasp of the average student. This work includes the theory and practice of direct current generators and motors and auxiliary apparatus, taking into account also the principles of design.

**Direct Current Laboratory.** The work under this head is parallel with the foregoing, and includes all standard tests of direct current machines, and is supplemented by numerous experiments arranged with due regard to their general importance and scientific value. The machines with which the student has become more or less familiar during his Sophomore year are now examined in detail and careful records made of efficiency, regulation, internal characteristics, commutation under varying loads, etc.

**Direct Current Design.** When the foregoing courses have been finished each student is directed to design a specified machine and is required to do this work in class and without other aid than that given by the instructor. Complete calculations, with curves, where necessary, and full working drawings of the machine designed, are required, and credit is given for accuracy, originality and neatness.

**Alternating Current Circuits and Apparatus.** The importance of alternating currents in modern electrical engineering and the complex nature of their phenomena make it essential that a large amount of time be spent in the study of alternating current circuits and apparatus. This work is taken up in the second term of Junior year immediately after the completion of direct current theory and in conjunction with direct current design and is continued throughout the Junior and during a part of the Senior year. The work included under this head covers the more elementary part of the subject and is made practical by the assignment of a large number of problems to be worked out by the student. It is carried on at the same time with the following course.

**Alternating Current Laboratory.** The work done here in the Junior year consists of an extensive series of experiments corroborating and explaining the theories of the lecture room. The exercises consist in investigation of voltage and current conditions on a variety of combinations of resistance, inductance and capacity in series and in multiple, the exploring of field flux and wave shapes of alternators, and the effect of inductance and capacity on wave shape. Upon entering the Senior year the student is thus equipped with the broad foundation in the underlying principles of electrical engineering, which is absolutely essential to a comprehensive study of the more intricate and special departments of the subject.

**Modern Theory of Electrical Engineering.** Here the subject of alternating current phenomena is continued throughout the Senior year. The method of treatment developed by Professor Charles



P. Steinmetz is used entirely, and is applied to the different apparatus, as transformers, induction motors, phase and frequency converters and other induction apparatus; alternators, synchronous motors, rotary converters and other synchronous apparatus, etc., which are thoroughly discussed with reference to theory, practical design and operation under varying conditions.

**Alternating Current Laboratory.** In this course, which is parallel with the foregoing, complete tests are made on the apparatus studied, and the characteristics of the various machines are determined. The laboratory work deals with the transformer: ratio, impedance and coreloss characteristic, regulation and heat runs, the synchronous motor and generator: amplitude and phase displacement of the various phases of multiphase machines, no load and load saturation, phase characteristics, pulsation, regulation and compounding curves, starting test, etc., the induction motor: determination and plotting of curves for power factor, speed, slip, torque, efficiency, apparent efficiency as function of load and as function of speed, starting tests on motors with squirrel cage armatures and compensator, also on machines with variable rotor resistance, impedance and coreloss curves and maximum output determination, the single phase induction motor, etc.

**Alternating Current Machine Design.** This subject is taken up in the Senior year and problems are assigned to each student, such as design of transformers, induction motors, etc.

The foregoing courses cover the general theory of electrical phenomena and machinery. The application of this knowledge to the various fields of electrical engineering work is taken up in the following courses.

**Electric Lighting.** This covers methods of using electricity in the production of light, systems of distribution, their comparative economy and efficiency, central station layout and equipment, switchboard design, electricity meters, lightning protection, standard wiring, indoors and out-of-doors.



**Electric Transmissions.** The subjects discussed here are long distance transmissions, line construction, systems, grouping of machines, control of phase, methods of compensation, maximum power supplied over line, line efficiency, copper efficiency, distributed capacity, inductance, resistance, leakage and natural period of transmission line, surging, resonance due to higher harmonics, balanced and unbalanced polyphase systems, transformations.

A part of this course, dealing with the more intricate problems, is given by Prof. Steinmetz personally.

**Electric Railways.** The subject of electric railway engineering is treated in three sections: 1. From the point of view of the consulting engineer who, being retained by the promoters of a proposed railway, investigates the field and territory of the new line, advises as to probable earnings of line, lays out route, prepares plans and specifications and has charge of construction. 2. From the point of view of the operating engineers who have charge of rolling stock and maintenance of service on the line. This includes a complete discussion of the equipment of modern electric railways, the various systems in vogue, sub-station equipment and in general the operation of electric railways. 3. The problem of the electric railway as it is presented to the designing electrical engineer is discussed. About half of the time devoted to railways is reserved for this section of the work. The questions of pre-determination of railway motors from service characteristics, of train resistance and other quantities affecting the operation of electric trains are treated and the various alternating current railway motors which are being developed are discussed. The experimental railroad operated by the General Electric Company in Schenectady is a valuable auxiliary in this course.

**Electrochemistry.** This course is given every second year to both Juniors and Seniors, under the direction of the Electrochemical Research Laboratory of the General Electric Company. It includes the theory of solutions, osmotic pressure, dissociation, concentrations and an outline of the principles underlying the many electrochemical processes of commerce.

**Scientific Literature and Current Technical Periodicals.** This includes publications in French and German. This course is designed to direct the student where and how to get information regarding any particular subject. Included in this course are reviews of the biographies of several of the great physicists. A few of the salient points in a wide range of subjects are treated, with the idea of stimulating independent interest.

**Lectures by Electrical Engineers.** Throughout the Junior and Senior years lectures on technical subjects are delivered before the electrical engineering students by prominent electrical engineers who are specialists in the branch on which they lecture.

During the year 1904-1905 the following lectures were given:

C. P. STEINMETZ, Units.

H. G. REIST, Armature Winding.

J. HARDEN, High Temperatures.

C. P. STEINMETZ, General Transformer, Frequency Converter, etc.

W. S. MOODY, Transformer Practice.

M. O. TROY, Constant Current Transformer.

DR. WHITNEY, Principles of Electrochemistry.

C. P. STEINMETZ, Science and Engineering.

J. HARDEN, Electrochemistry in Agriculture.

A. G. DAVIS, The Engineer and the Patent Law.

O. JUNGREN, Underlying Principles of the Steam Turbine.

C. P. STEINMETZ, Prime Movers.

A. L. ROHREB, Cost of Power.

W. I. SLICHTER, Some Characteristics of Railway Motors.

S. T. DODD, The Development of Railway Motors.

C. P. STEINMETZ, Lightning and Lightning Protection.

M. O. TROY, Condensers.

W. S. ANDREWS, Radium.

C. P. STEINMETZ, Unsolved Problems.

D. B. RUSHMORE, Design of Alternators (illustrated).

J. B. BAKER, Three lectures on Telephone Practice.

C. M. GREENE, Arc Light Machines.

### **Electrical Laboratory Equipment**

The equipment of the Electrical Engineering Laboratory has been greatly augmented of late by a large amount of apparatus, a considerable portion being donated by the General Electric Company, and the laboratory was extended to accommodate this apparatus.

More recent additions to the apparatus have required more space. A new Electrical Engineering Laboratory is now being built, and is expected to be completed by the beginning of the year. The ground plan of this building has the form of a T. It has a two story frontage of 73 ft., and a depth over all of 101 ft.

The purpose of a college laboratory of Electrical Engineering is two-fold: To familiarize the student with the shape, appearance, relative proportions and construction of modern electrical apparatus, and to instruct him in the handling, assembling, testing and operation of electrical apparatus under normal and abnormal conditions.

Because of the great variety and large size of modern electrical apparatus, the former purpose can be fulfilled very incompletely only, even in the largest and best equipped college laboratories. Through the favorable disposition of the General Electric Company, by giving the Electrical Engineering students of Union College free access to the works and testing rooms, this purpose is admirably fulfilled here, and by frequent and regular inspection trips to the Works and Testing Department of the General Electric Company under the direction of the college instructors, which trips constitute an integral part of the laboratory instruction, the students gain a very intimate knowledge of modern electrical apparatus of all types and sizes, not only when assembled and in operation and test, but also during their construction in the shops.

In equipping the college laboratory special consideration was therefore given to the selection only of such representative types of apparatus as can be handled, operated and tested by the students, and of a size sufficiently large to correspond to modern practice, but not so large as to make the operation under abnormal conditions—that is, under conditions which as a rule are specially instructive—unsafe for the apparatus. Entirely excluded

from the laboratory equipment was all such machinery as the students could not be permitted to handle freely.

Three sources of power are provided: A direct connected unit, consisting of a Westinghouse gas engine and a Westinghouse direct current generator; connection with the 500-volt trolley circuit of the Schenectady Railway Company, and connection with the primary three phase distributing mains of the 2,300-volt alternating current city circuit. In the latter case the voltage is reduced by banks of step-down transformers, so that the students can handle the safe low tension circuits only.

A very large number of various sizes of transformers are provided to give the students practical experience in connecting transformers for different ratios and for transformation between three-phase, quarter-phase, six-phase, etc., systems. The equipment further contains three-phase, quarter-phase and six-phase alternators and synchronous motors, the two characteristic types of induction motors, three and six-phase rotary converters, and numerous smaller induction motors, converters and direct current motors and generators of different types. A constant current arc machine, with different types of arc lamps and a constant alternating current transformer, with series arc lamps, a storage battery, testing tables, switchboards and numerous instruments of the indicating and the integrating type, are also provided for efficient instruction.

Power is distributed from a central switchboard to the various smaller machines in the Department, to the mechanical workshop provided for the students, and to the general lighting circuit of the building, and further extensions of the laboratory are under contemplation.

### **Graduate Course—One Year**

Leading to the Degree of M. E. E.

To those students who, after graduating from the four-year Electrical Engineering course, desire to increase their knowledge a Graduate Course is offered in which, besides instruction in higher branches of Electrical Engineering, there will be occasion to carry out original investigations under the supervision and with the

assistance of specialists prominent in Electrical Engineering practice on subjects closely connected with the most recent advance of Electrical Engineering. In return for the assistance offered to the Graduate students in their research work by prominent specialists the Graduate students will be required to devote a small part of their time to assisting the regular University instructors in laboratory instruction. This course leads to the degree of Master of Electrical Engineering, and is open to graduates of Union College or of other institutions approved by the Faculty.

Some of the courses offered to the graduate students are:

- Advanced Calculus, 1 term, 1 hour.
- Differential Equations, 1 term, 1 hour.
- Long Distance Transmission, 2 terms, 2 hours.
- Design and Control of Electric Power Systems of Very Great Magnitude, 2 terms, 2 hours.
- Electric Railway and Traction, continued, 3 terms, 2 hours.
- Modern Theory of Electrical Engineering, continued, 3 terms, 2 hours.
- Oscillating Currents and High Frequency Phenomena, 2 terms, 1 hour.
- Lightning and Lightning Protection, 1 term, 2 hours.
- Wave Transmission, with Special Application to Telephony, 1 term, 2 hours.
- Scientific Foundations of Electrical Engineering, 2 terms, 2 hours.
- Electro-Chemistry, 1 term, 2 hours.
- Chemistry of Very High Temperature, 1 term, 2 hours.
- Laboratory.
- Research Work.

Some of the lectures given by Professor Charles P. Steinmetz for Graduates are as follows:

Review: The Electric, Magnetic and Dielectric Circuit. Resistance, Inductance, Capacity and Wireless Telegraphy.

The Law of Electromagnetic Induction; Electric Apparatus and Machines.



The Characteristic Curves of Electrical Apparatus, Machines and Circuits, Magnetic Characteristic: Saturation and Excitation Curve. Load Characteristic: Regulation Curve, Field Characteristic, Compounding Curve. Phase Characteristic of Alternating Current Apparatus; Efficiency, No Load and Load Losses.

Commutating Machines: Direct Current Generators and Motors.

Synchronous Machines: Alternators and Synchronous Motors and Converters.

Induction Machines: Induction Motors and Generators, Single Phase and Polyphase Repulsion Motors and Generators.

Rectifying Machines: The Arc Machine, Constant Potential and Constant Current Rectification.

Transformers and Reactors: Constant Potential and Constant Current.

Meters: Indicating, Integrating and Recording.

Transient Phenomena: Starting and Building Up of Direct Current Generators; Effect of Field Inductance and Fluctuating Load. Starting of Synchronous Machines.

Starting of Transformers, of Inductive Circuits, of Circuits containing Inductance and Capacity, Transmission Lines. Short Circuit Phenomena of Circuits containing Inductance and Capacity. Transmission Lines, Short Circuit Oscillations.

Short Circuit Current of Direct and Alternating Current Generators.

Hunting or Surging of Synchronous Machines, Motors and Converters. Hunting or Surging of Induction Machines, of Direct Current Motors and Generators.

In addition hereto, a course is given on the design of electrical apparatus, in which the students carry out the design of a number of typical machines and apparatus under the personal direction of Prof. Steinmetz; and the course includes the discussion of all the elements entering into the practical design and construction.

For special information regarding the Department of Electrical Engineering, address

CHARLES P. STEINMETZ,  
Professor of Electrical Engineering,  
Schenectady, N. Y.



**CURRICULUM OF THE B. E. COURSE<sup>1</sup>  
GENERAL ENGINEERING**

	First Term	Second Term	Third Term
Freshman Year <sup>2</sup>	3 French <sup>3</sup> 3 German 3 Freehand Drawing 4 Algebra 2 Rhetoric 1 Physiology Lectures	3 French <sup>3</sup> 3 German 4 Analytic Geometry 2 Mensuration 3 Mechanical Drawing 2 Rhetoric 1 Gymnastics Lectures	3 French <sup>3</sup> 3 Calculus 3 German 2 Rhetoric 2 Analytic Geometry 2 Surveying and Plotting 1 Physiology 1 Trigonometry Summer Vacation Work
Sophomore Year <sup>2</sup>	3 Calculus 3 Mechanics 3 Physics 3 English Literature 3 German <sup>4</sup> 3 Chemistry 2 Surveying and Plotting 1 Hygiene 1 Rhetoric	3 Calculus 2 Mechanics 4 Physics 2 English Literature 3 German <sup>4</sup> 3 Chemistry 3 Descriptive Geometry 1 Electrical Laboratory 1 Rhetoric	1 Mechanics 4 Physics 2 Calculus 5 Chemistry 3 Topographical Surveying 3 Descriptive Geometry ; Shades and Shadows 1 Electrical Laboratory 3 German <sup>4</sup> 1 Rhetoric Summer Vacation Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Identical in General, Sanitary and Electrical Engineering courses.

<sup>3</sup>Those who passed French at entrance take Chemistry instead.

<sup>4</sup>Taken in place of Chemistry by those who passed French at entrance.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>  
GENERAL ENGINEERING, OPTION A

	First Term	Second Term	Third Term
Junior Year <sup>2</sup>	5 Topographical Surveying 4 Applied Mechanics 3 Chemical Laboratory 2 American History 3 Highways and Pavements 1 Rhetoric	5 Mechanics of Materials and Eng. Laboratory 2 American History 3 Kinematics Machine Drawing 2 Thermodynamics 1 Natural Perspective 3 Electricity 1 Rhetoric	4 Stresses in Structures and Graph. Analysis 3 Hydraulics 2 Stereotomy 3 Route Surveying 3 Spher. Trigonometry and Astronomy 2 American History 1 Rhetoric Inspection Trips Summer Vacation Work
	2 Motors and Motive Power 4 Engineering Stresses 3 Economics 5 Railroad and Trolley Road Construction 2 Outlines of Architecture 2 Economic Geology One Literary Essay One Tech. Essay Inspection Trips	3 Motors and Motive Power 4 Engineering Design and Construction 2 Water Supply Engineering 2 Building Construction 3 Method of Least Squares 3 Sanitary Biology One Literary Essay One Tech. Essay	5 Engineering Design and Construction 3 Engineering Law and Procedure 3 Geodesy and Field Astronomy 5 Water Supply, Sewerage and Sewage Disposal Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>The Junior Year is identical in General and Sanitary Engineering courses.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**GENERAL ENGINEERING, OPTION B**

	First Term	Second Term	Third Term
<b>Junior Year</b>	2 Topographical Surveying 4 Applied Mechanics 3 Chemical Laboratory 2 American History 2 English History 3 Highways and Pavements 1 Rhetoric 1 Elements of Law	5 Mechanics of Materials and Eng. Laboratory 2 American History 2 English History 2 Thermodynamics 2 Elements of Law 3 Electrical Machinery 1 Rhetoric	4 Stresses in Structures and Graph. Analysis 3 Hydraulics 2 French History 3 Route Surveying 3 Law of Property and Contracts 2 American History 1 Rhetoric Inspection Trips Summer Vacation Work
<b>Senior Year</b>	2 Motors and Motive Power 4 Engineering Stresses 3 Economics 2 Political Science 2 Outlines of Architecture 3 Principle and Law of Corporations 2 Economic Geology One Literary Essay One Tech. Essay Inspection Trips	3 Motors and Motive Power 4 Engineering Design and Construction 2 Water Supply Engineering 2 Building Construction 2 Political Science 3 Sociology 2 Principles of Finance and Financial Operations One Literary Essay One Tech. Essay	5 Engineering Design and Construction 2 International Law 3 Sociology 3 Principles of Administration 3 Principles of Accounting Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**SANITARY ENGINEERING**

[The Freshman, Sophomore and Junior years of this course are identical with those years in the General Engineering Course following Option A.]

**SENIOR YEAR**

First Term	Second Term	Third Term
2 Motors and Motive Power	3 Motors and Motive Power	5 Engineering Design and Construction
4 Engineering Stresses	4 Engineering Design and Construction	3 Engineering Law and Procedure
3 Economics	2 Water Supply Engineering	5 Sewerage and Sewage Disposal
3 Heating and Ventilation	2 Chemical Laboratory	1 Sanitary Codes and Laws
3 Chemical Laboratory	3 Sanitary Biology	1 House Draining and Plumbing
2 Economic Geology	3 Bacteriology	2 Electives <sup>2</sup>
One Literary Essay	One Literary Essay	Thesis
One Tech. Essay	One Tech. Essay	
Inspection Trips	Inspection Trips	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see page 108.

# CURRICULUM OF THE B. E. COURSE<sup>1</sup> ELECTRICAL ENGINEERING

For the general plan of the course, see page 149.

Freshman and Sophomore Years as in General Course, page 162.

## JUNIOR YEAR

First Term	Second Term	Third Term
1 Mathematics	1 Mathematics	1 Mathematics
4 Applied Me- chanics	1 Natural Per- spective	2 Elements of Civil Engi- neering
3 Analytic Chemistry	2 Hydraulic Tur- bine	4 Steam Engine Design
3 Hydraulics and Hydraulic Design	4 Theory of Steam En- gine	2 Altern. Cur. Circuit and Apparatus
2 Direct Current Circuit and Apparatus	2 Direct Current Circuit and Apparatus	2 Electrical Laboratory
2 Direct Current Laboratory	2 Altern. Cur. Circuit and Apparatus	2 Elect. Appa- ratus Design
2 American History	2 Electrical Laboratory	2 Electric Lighting
1 Rhetoric Lecture Course by Special- ists <sup>2</sup>	2 American History	2 American History
Inspection Trips	2 Electrochem- istry	1 Rhetoric Lecture Course by Special- ists <sup>2</sup>
	1 Rhetoric Lecture Course by Special- ists <sup>2</sup>	Inspection Trips Summer Vaca- tion Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>See page 157.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**ELECTRICAL ENGINEERING**

For the general plan of the course, see page 149.

Freshman and Sophomore Years as in General Course, page 162.

**SENIOR YEAR**

First Term	Second Term	Third Term
3 Thermodynamics, Gas Engines and Steam Turbine	3 Transmission and Distribution	3 Elect. Apparatus Design
2 Altern. Cur. Circuit and Apparatus	2 Altern. Cur. Circuit and Apparatus	3 Transmission and Distribution
2 Electrical Laboratory	2 Electrical Laboratory	2 Electric Railway
2 Elect. Apparatus Design	3 Elect. Apparatus Design	3 Mod. Theory of Electrical Engineering
3 Transmission and Distribution	2 Electric Railway	3 Engineering Law and Procedure
2 Mod. Theory of Electrical Engineering	2 Electro-chemistry	1 Tech. French or German Thesis
3 Economics	3 Mod. Theory of Electrical Engineering	Lecture Course by Specialists <sup>2</sup>
1 Tech. French or German One Literary Essay	1 Tech. French or German One Literary Essay	Inspection Trips
One Technical Essay	One Technical Essay	
Lecture Course by Specialists <sup>2</sup>	Lecture Course by Specialists <sup>2</sup>	
Inspection Trips		

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>See page 157.





ALBANY MEDICAL COLLEGE

ALBANY, N. Y.

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MEDICAL DEPARTMENT OF

UNION UNIVERSITY

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SEVENTY-FIFTH SESSION

## ALBANY MEDICAL COLLEGE

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The Medical College building, situated on Eagle street, Albany, is well appointed in its lecture rooms, laboratories, dissecting room and museums. The chemical laboratory is fitted with every requisite for the illustration of the lectures and the use of students, while the Bender Hygienic Laboratory furnishes unexcelled facilities for instruction in histology, pathology, bacteriology and clinical microscopy.

The location of the college is such as to afford superior advantages to the student. The hospitals and dispensaries furnish an abundant supply of material for the illustration of clinical medicine and surgery, while the museums are especially rich in anatomical and pathological preparations.

With the session of 1897-'98 a four-year course was inaugurated, and four courses are now required by law in this state. The curriculum embraces lectures by professors and lecturers; recitations conducted mainly by instructors, and practical demonstrations, clinical teaching and laboratory work, in which the professors in the different departments are assisted by clinical assistants and demonstrators.

The Albany Hospital, St. Peter's Hospital, Child's Hospital, St. Margaret's House, Albany Hospital for Incurables, County Hospital, South End Dispensary, Eye and Ear Infirmary, Albany Orphan Asylum and dispensaries connected with each are, by the regulations of their governing boards, made available for clinical purposes to the students.

Appointments to positions on the house staffs of the Albany Hospital, and other hospitals in Albany and neighboring places, are annually made, and are competed for by the members of the graduating class.

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Albany Medical College,

Albany, N. Y.

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---

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Chancellor of the University

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Otology

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Diseases of the Throat and Nose

LEO HAENDEL NEUMAN, M. D.

Theory and Practice of Medicine and Gastro-Enteric Diseases

JESSE MONTGOMERY MOSHER, M. D.

Insanity, Neurology and Electro-Therapeutics

HARRY JUDSON LIPES, M. D.

Obstetrics

---

### Adjunct Professors

SPENCER LYMAN DAWES, M. D.

Materia Medica

HOLMES CONDUCT JACKSON, PH. D.

Physiological Chemistry



**Lecturers**

WILLIAM OLIN STILLMAN, M. D.

History of Medicine

CHARLES HARPER RICHARDSON, M. D.

Minor Surgery

ARTHUR WELLS ELTING, M. D.

Surgical Pathology

GEORGE EMORY LOCHNER, M. D.

Gynecology

ARTHUR TURNER LAIRD, M. D.

Clinical Microscopy

THEODORE JAMES BRADLEY, B. S., PH. G.

Inorganic Chemistry

CHARLES HENRY MOORE, M. D.

Ophthalmology and Otology

CLEMENT FRANK THEISEN, M. D.

Diseases of Throat and Nose

ARTHUR SAUTTER, M. D.

Dermatology and Genito-Urinary Diseases

HENRY LARNED KEITH SHAW, M. D.

Diseases of Children

HERBERT DODGE PEASE, M. D.

Antitoxins and Immunity

EDGAR ALBERT VANDER VEER, M. D.

Clinical Surgery

WILFRED SILVESTER HALE, M. D.

Anatomy. Demonstrator of Anatomy and Assistant Curator of  
Museum

EDWIN MACDONALD STANTON, M. D.

Histology

JOHN ALBERTSON SAMPSON, M. D.

Gynecology

**Instructors**

ALVAH HARRY TRAVER, M. D.  
Surgery

EDGAR ROSCOE STILLMAN, M. D.  
Physiology

EDWARD WATERBURY BECKER, M. D.  
Physiology

HARRY WARDELL CAREY, M. D.  
Surgical Pathology

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Ophthalmiology

EDWARD GERALD GRIFFIN, M. D.  
Theory and Practice of Medicine

JAMES FRANCIS ROONEY, M. D.  
Theory and Practice of Medicine

JAMES WESLEY WILTSE, M. D.  
Dermatology and Genito-Urinary Diseases

HOWARD EATON LOMAX, M. D.  
Anatomy and Assistant Demonstrator of Anatomy

CHARLES KNICKERBACKER WINNE, Jr., M. D.  
Bacteriology, Materia Medica and Therapeutics

GEORGE GUSTAVE LEMPE, M. D.  
Anatomy

EDWIN FORREST SIBLEY, M. D.  
Surgical Pathology

SILAS LORENZO FILKINS, M. D.  
Anatomy and Prosector of Anatomy

LA SALLE ARCHAMBAULT, M. D.  
Neurology

LEON KAHN BALDAUF, M. D.  
Histology

HAROLD EUGENE ROBERTSON, M. D.  
Bacteriology and Pathology

GEORGE EVERETT BEILBY, M. D.  
Histology

ERNEST VICTOR FREDERICK, L. R. C., P. (Lond.)  
Physiology and Clinical Microscopy

JOSEPH ALOYSIUS LANAHAN, M. D.  
Dermatology

### Clinical Assistants

WILLIAM HENRY GEORGE, M. D.	JOHN HENRY GUTMANN, M. D.
MICHAEL DANIEL STEVENSON, M. D.	MALCOLM DOUGLAS, M. D.
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MARTIN MACHARG, M. D.	ARTHUR HAMILTON SCHUYLER,
LOUIS LEBRUN, M. D.	M. D.
JAMES MANNING MOORE, M. D.	JOHN RALPH SCHERMERHORN,
WILLIAM PITNEY BRIERLEY, M.D.	M. D.
JOSEPH PATRICK O'BRIEN, M. D.	GEORGE MORRIS CASEY, M. D.
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ARTHUR FENWICK HOLDING, M. D.	FRANK JAMES HURLEY, M. D.
JOSEPH AMBROSE COX, M. D.	

**CALENDAR, 1906-1907**

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1906

Regular winter session begins.....Tuesday, September 25  
Thanksgiving vacation begins.....Wednesday, November 28  
Lectures resumed.....Monday, December 3  
Christmas vacation begins.....Saturday, December 22

## 1907

Lectures resumed.....Thursday, January 3  
Commencement.....Tuesday, May 7

**PRELIMINARY EXAMINATION.**—The preliminary examination of medical students is under the control of the Board of Regents of the University of the State of New York. Those contemplating the study of medicine should apply to the High School Department, University State of New York, Albany, by letter or otherwise, if information concerning this examination further than that given in the catalogue of the Medical College is desired. One of the examinations will be held in Albany, September 25-28, 1906.

**MID-WINTER WRITTEN EXAMINATIONS** in all the departments are held before the Christmas vacation. A printed schedule of these examinations is furnished the class.

**Course of Instruction**

The four years' graded course required of all candidates for the degree of Doctor of Medicine embraces the following subjects:

**First Year**

1. **Anatomy**—three lectures; six hours osteology and dissection. 2. **Inorganic Chemistry**—three lectures; four hours laboratory; one recitation. 3. **Physiology**—two lectures; one recitation; three hours demonstrations. 4. **Histology**—five hours laboratory; one recitation. 5. **Materia Medica**—four lectures; two recitations.

Lectures 12; laboratory 9 hours; dissection and demonstrations 9 hours; recitations 5.

**Second Year**

1. **Anatomy**—three lectures; seven and a half hours dissection and demonstration; two recitations. 2. **Organic Chemistry and Toxicology**—three lectures; one recitation. 3. **Hygiene**—one lecture. 4. **Physiology**—two lectures; one recitation. 5. **Therapeutics**—one lecture; one recitation. 6. **Theory and Practice**—two lectures; one recitation. 7. **Surgical Technic**—one lecture; one demonstration; two hours clinics. 8. **Bacteriology and Pathology**—eight and a half hours laboratory.

Lectures 13; dissections and demonstrations 8½ hours; laboratory 8½ hours; recitations 6; clinics 2.

**Third Year**

1. **Theory and Practice**—four lectures; two recitations; one hour clinics. 2. **Clinical Microscopy**—two and a half hours laboratory. 3. **Therapeutics**—two lectures; one recitation. 4. **Electro-therapeutics**—one lecture, half the term. 5. **Obstetrics**—two lectures. 6. **Pediatrics**—one lecture; one recitation half the term. 7. **Neurology**—one lecture; one recitation half the term; one clinic. 8. **Surgery (pathology, operative, fractures, dislocations)**—five lectures; two and a half hours laboratory; two recitations; three hours clinics. 9. **Physical Diagnosis and Ophthalmology**—section work, two hours. 10. **Medical Jurisprudence**—one lecture half the term. 11. **X Rays**—one demonstration half the term. 12. **Obstetrical Histology and Pathology**—two and a half hours laboratory. 13. **History of Medicine**—one lecture half the term. 14. **Conference**—one medical.

Lectures 17; laboratory 7½ hours; demonstrations ½ hour; conference 1; recitations 6; section work 2; clinics 5.

**Fourth Year**

1. **Theory and Practice**—three lectures; one recitation; two hours clinics. 2. **Neurology**—one lecture; one clinic. 3. **Gynecology**—one lecture. 4. **Obstetrics**—one lecture; one recitation. 5. **Surgery (including Orthopedics)**—four lectures; one recitation; three hours clinics. 6. **Specialties**—one recitation. 7. **Conferences**—one medical; one surgical. 8. **Clinical section work**—thirteen hours.

Lectures 10; recitations 4; conferences 2; clinics 6; clinical section work 13 hours.

The order of instruction for the ensuing session will be found in the catalogue of the Medical College, and may be obtained by application to the Registrar.

### Laboratories

**Practical Chemistry.** The chemical laboratory is well furnished and conveniently arranged, each student having a desk and reagents for his own use, and being supplied with all necessary apparatus. The laboratory course is preceded, since although some knowledge of chemistry is highly desirable, none is now *required* at entrance, by a series of lessons upon chemical nomenclature, notation and the essential principles of theoretical chemistry, including the laws of combination and valence, and these subjects are therefore more briefly treated in the regular lecture course. The practical laboratory work includes tests for those metals and acids which, in combination, are important as constituents of medicinal compounds or as poisons, together with the separation of the chief groups and the examination of unknown substances. The more important toxicological and urinary tests are performed and all chemical reactions are written upon the blackboard, discussed by the class, and entered upon their notes.

**Physiological Chemistry and Experimental Physiology.** A new laboratory for class work in Physiological Chemistry has been equipped in the south wing of the college building, and placed in charge of Holmes C. Jackson, Ph. D., who will conduct the laboratory work in this department. This work supplements that heretofore carried on in the departments of physiology and chemistry, and combines a number of subjects which have formed parts of other courses. This course is included in the work of the second year, and demonstrations in experimental physiology and pharmacology, to be given at the Bender Laboratory, will be combined with it. These courses will be of much value to students by giving them a more thorough and practical knowledge of the experimental sciences upon which modern medicine largely rests.



**Histology, Pathology, Bacteriology and Clinical Microscopy**

Work in these departments is carried on in the Bender Hygienic Laboratory, on Lake Avenue, near the Albany Hospital.

This building was erected by Mr. Matthew W. Bender, of Albany, and is thoroughly equipped with the apparatus necessary for the study of histology, pathology, bacteriology and clinical microscopy. Practical work in these branches is obligatory upon all students, and abundant opportunity is furnished in the laboratory for acquiring a thorough knowledge of these important subjects.

In histology the work consists of explanatory talks on the subject of the day's study, followed by microscopic study of sections, each student being required to make drawings of his sections. The different tissues and organs of the body are taken up systematically.

In bacteriology the work consists of lectures, followed by practical laboratory exercises. It is intended to render the student familiar with the underlying principles of bacteriology, and their application to clinical medicine and surgery.

In pathology the work consists of a short lecture on the subject for the day, followed by practical exercises in mounting, staining and examining sections. Students make drawings of their sections. They are instructed in the technique of making autopsies, and material from autopsies and surgical operations is demonstrated to them as available.

In clinical microscopy the course consists of practical work in the examination of blood, urine, sputum, fæces, etc.

A limited number of students who have shown proper aptitude will be allowed to work along more advanced lines during the summer months.

For the Alumni of this school, and for physicians in the vicinity this laboratory offers excellent facilities for the examination of urine, sputum, pathological specimens and blood. Information regarding such examinations may be obtained by communicating with Dr. Richard M. Pearce, Director.

**Practical Clinical Courses**

In order to familiarize students with the practical work of their profession, and to bring them into closer personal contact with patients, the fourth year class is divided into sections of eight or ten men, and on four days in each week each man devotes several hours to the examination and personal observation, under the supervision of the instructors, of patients in the wards and out-patient departments of the various hospitals and dispensaries. In this clinical work especial attention is devoted to the complete examination of the blood, urine, sputum and stomach contents, as well as to the special examination of the eye, ear and other organs. Thus in the course of the school year the men in each section acquire practical knowledge and technical diagnostic dexterity in general medicine, general surgery, dermatology, neurology, insanity, otology, laryngology, ophthalmology, rhinology, diseases of children and infants, infant feeding, diseases of the rectum and genito-urinary tract, operative surgery, orthopedic surgery, operative obstetrics, electro-therapeutics and medical technique.

**Fees and Expenses**

Fees, excepting the final examination fee, are payable in advance, are not returnable, and are as follows:

**FIRST YEAR.**

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Chemical Laboratory .....	10 00
Histological Laboratory .....	10 00
Dissection (including material) .....	5 00

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\$130 00

## SECOND YEAR.

Matriculation .....	\$ 5 00
Dissection (including material) .....	10 00
Lecture Course .....	100 00
Bacteriological and Pathological Laboratory ..	15 00
Physiological Chemistry Laboratory .....	15 00
	<hr/>
	\$145 00

## THIRD YEAR.

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Clinical Microscopy Laboratory .....	5 00
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	\$110 00

## FOURTH YEAR.

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Final Examination .....	25 00
	<hr/>
	\$130 00

In addition to the fees above stated, an annual charge of two dollars is made to members of the first, second and third year classes taking laboratory courses at the Bender Laboratory, for use of microscopes and other apparatus. This fee is paid to the director at the laboratory, and after laboratory tickets have been issued by the registrar.

The payment of three hundred dollars in advance entitles to attendance upon four courses of lectures, exclusive of laboratory and other special fees above stated, and effects a saving of one hundred dollars on the cost of the four year course, *but this ticket must be taken out within thirty days from date of matriculation.* The final examination fee must be paid before the examinations begin. Graduates of the school may attend lectures and stated clinics without charge except for matriculation in case of prolonged attendance.

The cost of living in Albany is less than in most other cities of its size. The janitor of the college keeps a list of boarding houses at which good rooms and board can be obtained at from four to five dollars a week or upwards, and by clubbing together students can live comfortably at still lower rates.

### Requirements for Graduation

The candidate must be twenty-one years of age, and exhibit a certificate from a physician or surgeon, duly authorized by law to practice his profession, that he has studied medicine and surgery under his instruction during the period required by law in this state, and he must present evidence of having complied with the law concerning preliminary examination.

He must have attended not less than four regular courses of lectures, of which the last shall have been at this college. Students who have attended one or more courses of lectures at other recognized medical colleges, who may desire to be admitted to advanced standing in this college, will be credited with the work they may have done and with examinations they may have passed, other than those of the senior year, if satisfactory evidence of such attendance and of the passing of such examinations is presented.

He must be of good moral character.

He must maintain a satisfactory standing during his course and pass a satisfactory final examination in the several branches taught.

Regular and punctual attendance is required, and matriculation tickets are endorsed with attendance at the end of the term.

For catalogues or further information address

WILLIS G. TUCKER, M. D., *Registrar*,

Albany, N. Y.

*January 1, 1906*



ALBANY LAW SCHOOL

ALBANY, N. Y.

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LAW DEPARTMENT

UNION UNIVERSITY

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FIFTY-SIXTH YEAR

1906-1907



## ALBANY LAW SCHOOL

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This School is among the oldest institutions of the kind in the country, having been established in 1851, and its graduates number many of the most successful men in the profession. The school is and has been largely represented in the Executive, Judicial and Legislative departments of this and many other States, as well as of the federal government.

It became a part of Union University in 1873, and begins its fifty-sixth year as a law school with the present scholastic year. During its long and successful career it has, in common with other law schools, done much to demonstrate what was at one time doubtful, but is now accepted almost as an axiom, that a course at the law school is a well-nigh necessary prerequisite to a successful professional career. Its instructors have always been men of repute and standing, both for professional learning and personal character.

### Local Advantages

The local advantages of the city of Albany, as the seat of a professional school, can not be overrated. It is the capital of one of the leading States in the Union, whose legislature is in session here for the third part of the year, presenting opportunities not afforded by any other Law School in the State for observing the methods and procedure collectively of the executive, judicial and legislative departments of the State government. The knowledge thus obtained by the students at law, who are to complete their course and to enter the realm of public affairs, can not be overestimated.

It is easily accessible, remarkably healthful, and the scene of great business and professional activity. It is large enough to afford its inhabitants all the means of culture and recreation naturally to be looked for in a city, while it is not so large as to make the cost of living burdensome, even to persons of extremely limited means.

**Facilities for Study**

The facilities afforded the students for reading and study are unsurpassed.

Besides the convenient and well chosen library of the school accessible to the students at all hours of the day and evening, the students have the privilege of using the State Law Library, the most extensive and best selected in the United States, consisting of 65,000 volumes or more.

With free access to these libraries the student may be relieved to a great extent from purchasing text-books.

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Elementary Law, Domestic Relations

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HON. WALTER E. WARD  
Patents, Copyrights and Trade Marks

STEPHEN B. GRISWOLD  
Books and Their Uses

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**Special Lecturers**

The list of special lecturers is a notable one, including the former Chief Judge and an Associate Judge of the Court of Appeals, two Justices of the Supreme Court and a former Attorney-General.

**Hubbard Chair of Legal Ethics**

The circulars of seventy of the leading Law Schools of the country show that only twenty of this number make the subject of Legal Ethics part of their curriculum. With two exceptions, those schools are either in the West or South. These facts led Gen. Thomas H. Hubbard, class of '60, to place at the disposal of the Board of Trustees the sum of \$10,000, the income to be applied to lectures upon this subject. The Board of Trustees decided to inaugurate the course at the opening of the school year of 1903. Gen. Hubbard, the founder of the chair, delivered the opening lecture, and will be followed during the academic year 1905-6 by Judge William E. Werner of the Court of Appeals, Hon. Alton B. Parker, late Chief Judge of that Court, and others.

**Academic Year**

The full academic course leading to the degree of LL. B. is two years, divided into two semesters each. The graduating course, preceded by one or two years in a law office, is one year. The latter course does not entitle a student to a Degree.

**Requirements for Admission to Junior Class**

The full course for study consists of two scholastic years. Any student who has conformed to the requirements of the Regents as to general education, or satisfies the Faculty that he will so conform to such requirements within the year allowed by the Regents for that purpose, after commencing the study of law, may enter the Junior class, and upon completion of the two years course and passing the required examinations will be graduated with the degree of LL. B.

College graduates will find this course well adapted to the requirements of the Court of Appeals, requiring them to study law two calendar years after graduation. They can enter the school upon presentation of their certificate of graduation, without examination, attend the full course of two years, of not less than eight months each, receive the degree of LL. B., and take the bar examination in June following their graduation from the school.

**Requirements for Admission to Senior Class**

Any student not a college graduate who has completed two years of required legal study, after conforming to the requirements of the Regents as to general education, or any college graduate who has completed one year of such study after graduation, and any student presenting a certificate that he has satisfactorily completed one year of study at a law school of recognized standard, will be admitted to the Senior class without examination upon production of the Regents' certificates and certificate of Clerk of Court of Appeals, and will be graduated in the same manner as students have heretofore been graduated in

the one year course, and receive a certificate for the time spent at the school; but the degree of LL. B. will be conferred only upon students who have completed the entire course of two years at a law school.

### **Requirements for Graduation**

Candidates for graduation not candidates for the degree of LL. B. must have attended one year of not less than eight months, after one or two calendar years of ten months each of legal study, or have passed in the work of the Junior year, and must have passed all examinations and conformed to all the requirements as stated above.

### **Tuition**

The fees for tuition are payable in advance, as follows: For the full course of one year, tuition, \$100; matriculation fee, \$10; diploma fee, \$10; or \$60 for the first semester and \$60 for the second. For the full course of two years and degree of LL. B., tuition, \$100 each year; matriculation fee, \$10; degree, \$10; or \$60 for the first semester and \$50 for each semester thereafter, except the last, which will be \$60.

For catalogues or further information address

ALBANY LAW SCHOOL, ALBANY, N. Y.

JNO. J. HUGHES, Secretary.





DUDLEY OBSERVATORY

ALBANY, N. Y.

*Dudley Observatory*  
ALBANY, N. Y.

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## THE DUDLEY OBSERVATORY

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The Dudley Observatory is located on Lake Avenue, in the southwestern part of Albany, to which site it was removed in 1893 from its former location in the northern part of Albany. It is devoted to original researches in astronomy, according to the purpose of its founders and successive patrons. Its contributions to science are represented in two volumes of "Annals," and in other published volumes and memoirs contained in the transactions of learned societies and astronomical journals. Its principal line of work at the present time is the determination of problems relating to the positions and motions of the stars and of the solar system as a whole. The staff consists of the director, three assistants, and several computers.

The instrumental equipment of the Observatory is designed for the purposes of exact measurement in line with its chosen work. In the tower of the main building is the Pruyn Equatorial, with object-glass twelve inches in diameter. This instrument is equipped both for visual and photographic use, and is of a high order of mechanical perfection. The Olcott Meridian Circle is located in a separate building, especially designed for securing the utmost equality in the temperature between the external air and that in the building itself. Its object-glass is eight inches in diameter. It was made by Pistor and Martins, of Berlin, and is regarded by astronomers as a masterpiece of accurate workmanship. This instrument has been employed for many years in obtaining the measurements necessary for the construction of the numerous and elaborate star catalogues which have issued from the Dudley Observatory.

In addition to these instruments, the observatory is in possession of various small telescopes, clocks, chronographs and smaller apparatus.

The institution is supported by an endowment, chiefly contributed by Mrs. Blandina Dudley and the late Catharine W. Bruce; as well as by appropriations which have been received from the National Academy of Sciences, and from current contributions of trustees and friends of the institution.

Since 1902 annual grants have been made to the director of the observatory by the Carnegie Institution of Washington. These have been sufficient to provide for the entire force of assistants and computers now employed.

The Dudley Observatory is not designed to give general instruction in Astronomy, though special students contemplating instruction in professional lines have been received from time to time under an arrangement of computing service to the observatory.

The observatory is opened to visitors on Tuesday evening of each week from 8 to 10 o'clock.

For further particulars apply to

LEWIS BOSS,  
Director.

ALBANY COLLEGE OF PHARMACY

ALBANY, N. Y.

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DEPARTMENT OF PHARMACY OF

UNION UNIVERSITY



## ALBANY COLLEGE OF PHARMACY

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The Albany College of Pharmacy was created by act of the Board of Governors of Union University, June 11, 1881, and constitutes the *Department of Pharmacy of Union University*. It was incorporated as the "Albany College of Pharmacy," August 27, 1881.

The exercises of the college are held in the Albany Medical College building, on Eagle street, distant but a block from the Capitol, and in the pharmaceutical laboratory on Maiden Lane. The lecture rooms and laboratories are well adapted to the needs of the college and furnish to the faculty excellent facilities for imparting instruction. The lectures are delivered in the chemical lecture room on the first floor, adjoining which is the large and well fitted chemical laboratory, where instruction is given to the classes in practical chemistry. The collections in the different departments are very complete and afford the instructors ample facilities for the illustration of the lectures.

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Instructor in Materia Medica and Pharmacognosy

WILLIAM ATWOOD LARKIN  
Instructor in Physics

**Calendar for 1906-1907.**

**1906**

Introductory lecture, Monday, October 1.

Election vacation, Monday and Tuesday, November 5 and 6.

Thanksgiving vacation begins Wednesday, November 28.

Lectures resumed Monday, December 3.

Christmas vacation begins Monday, December 24.

**1907**

Lectures resumed Monday, January 7.

Commencement (date to be announced).

**Entrance Requirements**

All applicants for admission to regular standing in this college will be required to present a Pharmacy Student Certificate issued by the New York State Education Department. The requirement for the issuance of such certificate is the possession of twelve Regents' counts, or an educational equivalent acceptable to the Regents.

**The Curriculum**

of the college embraces—

**Chemistry**—Theoretical, General, Pharmaceutical and Analytical.

**Botany**—Structural, Systematic and Analytical.

**Materia Medica and Pharmacognosy.**

**Pharmacy**—Theoretical and practical.

**Microscopy**—Theoretical and practical in its relations to Pharmacy.

**Pharmaceutical Mathematics, Physics.**

**Requirements for Graduation.**

The diploma of this college confers the degree of Graduate in Pharmacy (Ph. G.). Applicants for this degree must be at least twenty-one years of age, of good moral character, have attended two full courses of lectures (which shall have included all laboratory practice) in this college, or the last course in this college and the first in some other college of pharmacy; have had, inclusive of the time of attendance at this college, four years' practical experience with some reputable and competent pharmacist; have passed a satisfactory examination and paid all fees as hereafter stated. Experience in wholesale stores cannot be taken in lieu of the practical experience in a retail pharmacy.

**Fees for Tuition****EACH YEAR**

Matriculation .....	\$ 5 00
Tuition .....	70 00

Students who have attended two full courses of lectures at this college may attend further courses without extra charge. Payment of fees for matriculation, laboratory, and recitation courses will, however, be required, should the courses be taken.

**Situations**

Students desirous of obtaining employment while attending college will be assisted as far as possible in securing situations, but employment cannot be promised in advance, and places cannot be secured by correspondence. During the past year the faculty has had a much larger number of openings offered for graduates to lucrative positions than it has been able to fill.

The demand on the part of employers for skilled assistants is steadily increasing, and a college diploma or license from an examining board is demanded by law of those who engage in the practice of pharmacy in most of the states and cities of the Union.

For separate catalogue giving more complete information address

THEODORE J. BRADLEY, Ph. G., Secretary,

4 Lancaster Street, Albany, N. Y.



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ANNUAL CATALOGUE  
OF  
UNION UNIVERSITY



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1906-1907

ONE HUNDRED AND TWELFTH YEAR

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NEW YORK  
PRESS OF JOHN B. WATKINS COMPANY  
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ANNUAL CATALOGUE  
OF  
UNION UNIVERSITY



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1906-1907

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NEW YORK  
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UNION UNIVERSITY

# COLLEGE CALENDAR FOR 1907

	S	M	T	W	T	F	S		S	M	T	W	T	F	S
<b>Jan.</b>	...	...	1	2	3	4	5	<b>July</b>	...	1	2	3	4	5	6
	6	7	8	9	10	11	12		7	8	9	10	11	12	13
	13	14	15	16	17	18	19		14	15	16	17	18	19	20
	20	21	22	23	24	25	26		21	22	23	24	25	26	27
	27	28	29	30	31	...	...		28	29	30	31	...	...	...
<b>Feb.</b>	...	...	...	...	...	...	...	<b>Aug.</b>	...	...	...	...	...	...	...
	...	...	...	...	...	1	2		...	...	...	...	1	2	3
	3	4	5	6	7	8	9		4	5	6	7	8	9	10
	10	11	12	13	14	15	16		11	12	13	14	15	16	17
	17	18	19	20	21	22	23		18	19	20	21	22	23	24
	24	25	26	27	28	...	...		25	26	27	28	29	30	31
<b>Mar.</b>	...	...	...	...	...	...	...	<b>Sept.</b>	...	...	...	...	...	...	...
	...	...	...	...	...	1	2		1	2	3	4	5	6	7
	3	4	5	6	7	8	9		8	9	10	11	12	13	14
	10	11	12	13	14	15	16		15	16	17	18	19	20	21
	17	18	19	20	21	22	23		22	23	24	25	26	27	28
	24	25	26	27	28	29	30		29	30	...	...	...	...	...
	31	...	...	...	...	...	...		...	...	...	...	...	...	...
<b>Apr.</b>	...	...	...	...	...	...	...	<b>Oct.</b>	...	...	1	2	3	4	5
	...	1	2	3	4	5	6		...	...	1	2	3	4	5
	7	8	9	10	11	12	13		6	7	8	9	10	11	12
	14	15	16	17	18	19	20		13	14	15	16	17	18	19
	21	22	23	24	25	26	27		20	21	22	23	24	25	26
	28	29	30	...	...	...	...		27	28	29	30	31	..	...
<b>May</b>	...	...	...	...	...	...	...	<b>Nov.</b>	...	...	...	...	...	...	...
	...	...	...	1	2	3	4		...	...	...	...	...	1	2
	...	...	...	1	2	3	4		3	4	5	6	7	8	9
	5	6	7	8	9	10	11		10	11	12	13	14	15	16
	12	13	14	15	16	17	18		17	18	19	20	21	22	23
	19	20	21	22	23	24	25		24	25	26	27	28	29	30
	26	27	28	29	30	31	...		...	...	...	...	...	...	...
<b>June</b>	...	...	...	...	...	...	1	<b>Dec.</b>	...	...	...	...	...	...	...
	...	...	...	...	...	...	1		...	...	...	...	...	...	...
	2	3	4	5	6	7	8		1	2	3	4	5	6	7
	9	10	11	12	13	14	15		8	9	10	11	12	13	14
	16	17	18	19	20	21	22		15	16	17	18	19	20	21
	23	24	25	26	27	28	29		22	23	24	25	26	27	28
	30	...	...	...	...	...	...		29	30	31	...	...	...	..

Figures in heavy type indicate days on which Union College is in session.

## UNIVERSITY CALENDAR

---

1907.

- |                |  |
|----------------|--|
| 2 Jan.         | Registration Day for Students, Winter term,<br>Union College.                                  |
| 3 Jan.         | Winter term of Medical College resumes.  |
| 3 Jan.         | Recitations begin, Union College.  |
| 7 Jan.         | Winter term College of Pharmacy resumes.   |
| 24 Jan.        | Day of Prayer for Colleges.  |
| 25 Jan.        | First semester of Law School ends.   |
| 29 Jan.        | Second semester of Law School begins.  |
| 16 Feb.        | Allison-Foote Prize Debate between the Lit-<br>erary Societies.                                |
| 22 Feb.        | Washington's Birthday.   |
| 2 March        | Examination for conditioned students.  |
| 23 March       | Winter term of Union College ends.   |
| 25 March       | Registration Day for Students, Spring term,<br>Union College.                                  |
| 26 March       | Recitations begin, Union College.  |
| Mar. 29-Apr. 1 | Easter Recess, Union College.  |
| 9 April        | Commencement of the College of Pharmacy.   |
| 15 April       | Selection of Junior and Sophomore prize<br>orators.  |
| 4 May          | Examination for conditioned students.  |
| 7 May          | Commencement of the Medical College.   |
| 15 May         | Date for presentation of prize essays.   |
| 30 May         | Memorial Day.  |
| 31 May         | Senior Examinations end.   |
| 4 June         | Commencement of Law School.  |
| 9 June         | Sunday. Baccalaureate Sermon, Union Col-<br>lege.  |
| 10 June        | Prize Contest in Extemporaneous Speaking,<br>and Prize Oratory of Juniors and Sopho-<br>mores. |
| 11 June        | Meeting of Trustees, Phi Beta Kappa, Sigma<br>Xi, Alumni.                                      |
| 12 June        | Commencement of Union College, the second<br>Wednesday in June, President's reception.         |



**University Calendar—Continued**

1907.

- 13-14 June Entrance examinations, Union College.  
 14 Sept. Examination for conditioned students.  
 16 Sept. Registration Day for Freshmen, Union College.  
 18 Sept. Registration Day for Students other than Freshmen, Union College. Entrance Examinations, Union College.  
 19 Sept. First Chapel Exercises and Recitations, Entrance Examinations concluded.  
 20 Sept. Freshman Recitations begin.  
 24 Sept. Registration Day, Law School.  
 24 Sept. Winter term of Medical College begins.  
 25 Sept. Law School begins.  
 7 Oct. The College of Pharmacy begins.  
 5 Nov. Election Day.  
 28 Nov. Thanksgiving Day. Recess four days.  
 7 Dec. Examination for conditioned students.  
 21 Dec. Fall term of Union College ends.

1908.

- 2 Jan. Registration Day for Students, Winter term, Union College.  
 3 Jan. Winter term of Medical College resumes.  
 3 Jan. Recitations begin, Union College.  
 3 Jan. Winter term of College of Pharmacy resumes.  
 23 Jan. Day of Prayer for Colleges.  
 15 Feb. Allison-Foote Prize Debate between the Literary Societies.  
 22 Feb. Washington's Birthday.  
 7 March Examination for conditioned students.  
 21 March Winter term of Union College ends.  
 23 March Registration Day for Students, Spring term, Union College.

**University Calendar—Concluded**

---

24 March	Recitations begin, Union College.
14 April	Commencement of the College of Pharmacy.
5 May	Commencement of the Medical College.
7 June	Sunday. Baccalaureate Sermon, Union College.
8 June	Prize Contest in Extemporaneous Speaking and Prize Oratory of Juniors and Sophomores.
9 June	Meeting of Trustees, Phi Beta Kappa, Sigma Xi, Alumni.
10 June	Commencement of Union College, the second Wednesday in June. President's reception.
11-12 June	Entrance Examinations, Union College.

UNION UNIVERSITY

UNION COLLEGE, Schenectady,  
N. Y.  
Founded 1795

Academic Department

Engineering School

Classical Course

Latin Scientific Course

Scientific Course

General Engineering Course

Sanitary Engineering Course

Electrical Engineering Course

---

MEDICAL COLLEGE, Albany, N. Y., Founded 1838

---

LAW SCHOOL, Albany, N. Y., Founded 1851

---

DUDLEY OBSERVATORY, Albany, N. Y., Founded 1852

---

COLLEGE OF PHARMACY, Albany, N. Y., Founded 1881

## UNION UNIVERSITY

---

Union University embraces the following institutions:

UNION COLLEGE

ALBANY MEDICAL COLLEGE

ALBANY LAW SCHOOL

DUDLEY OBSERVATORY

ALBANY COLLEGE OF PHARMACY

Union College acquired by its charter, granted in 1795, full University powers, but the creation of graduate institutions at Schenectady was not found practicable. Schools of Law and Medicine and also an Astronomical Observatory have long existed at Albany, only a few miles distant. The arrangement naturally suggested by these circumstances was, that the Professional Schools and the Observatory at Albany should be united with Union College, under the Charter and Board of Trustees of the latter. This was accordingly effected by the incorporation of Union University in 1873. The Albany College of Pharmacy was created by the Board of Governors, June 21, 1881, and incorporated as a Department of the University, August 21 of the same year.

The President of Union College and permanent Chancellor of Union University has the oversight of the University, each of the institutions having its resident Dean. The Dean of Union College acts in the place of the President in his absence, and also assists him in matters delegated to him by the President. The University Board of Governors is composed of permanent trustees of Union College and of representatives of each of the other institutions embraced in Union University.

**OFFICERS OF THE UNIVERSITY****Chancellor**

ANDREW V. V. RAYMOND, D. D., LL. D.

**Honorary Chancellor, 1906**

HON. GEORGE B. McCLELLAN, LL. D.  
Mayor of New York City

**Board of Governors****PRESIDENT**

SIMON W. ROSENDALE, Albany

**SECRETARY**

AMASA J. PARKER, LL.D., Albany

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EDWARD WINSLOW PAIGE, LL. D.....	New York City
JOHN H. STARIN.....	New York City
JOHN A. DeREMER, A. M.....	Schenectady
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WARNER MILLER, LL. D.....	Herkimer
NICHOLAS V. V. FRANCHOT, A. M.....	Olean
GEORGE F. SEWARD, LL. D.....	New York City
EDWIN W. RICE, JR., PH.D., ScD.....	Schenectady

**Albany Medical College**

SIMON W. ROSENDALE.....	Albany
ALDEN CHESTER.....	Albany

**Albany Law School**

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J. NEWTON FIERO, LL. D.....	Albany

**Dudley Observatory**

SAMUEL B. WARD, M. D., PH. D.....	Albany
BENJAMIN WALWORTH ARNOLD.....	Albany

**Albany College of Pharmacy**

WILLIS G. TUCKER, M. D., PH. D.....	Albany
CHARLES NEWMAN.....	Albany



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GEORGE LAWYER

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FRANK B. GILBERT

Professor of the Law of Real Property

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FRANK B. WILLIAMS, C. E., M. S., PH. D.

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Professor of Rhetoric and Public Speaking

ALVAH S. NEWCOMB

Professor of the Law of Damages

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Lecturer on Development of the Law

HON. IRVING G. VANN, LL. D.  
Lecturer on the Law of Insurance

HON. D. CADY HERRICK  
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prudence, and Law School Lecturer on  
Medical Jurisprudence

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and Gastro-Enteric Diseases

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Clinical Professor of Surgery, and Lecturer on Surgical Pathology.

JOHN A. SAMPSON, M. D.

Clinical Professor of Gynecology.

ARTHUR SAUTTER, M. D.

Clinical Professor of Dermatology and Lecturer on Surgical Pathology

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\*Absent on leave.



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Clinical Professor of Gynecology

CLEMENT F. THEISEN, M. D.

Clinical Professor of Diseases of Throat and Nose

HENRY LARNED KEITH SHAW, M. D.

Clinical Professor of Diseases of Children

C. F. F. GARIS, PH. B.

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Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. IN E. E.

Assistant Professor of Electrical Engineering

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HAMILTON W. MABIE, LL. D.

Lecturer on English Literature

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Lecturer on Surgical Technic

HERBERT DODGE PEASE, M. D.

Lecturer on Antitoxins and Immunity

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Lecturer on Hygiene and Instructor in Medicine, Physiological Chemistry and Experimental Physiology

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Instructor in Surgery

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Instructor in Physiology

EDWARD WATERBURY BECKER, M. D.

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Instructor in Anatomy

EDWIN FORREST SIBLEY, M. D.

Instructor in Surgical Pathology

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Instructor in Civil Engineering

WALTER M. CURTIS, S. B.

Instructor in Mechanical Engineering

SILAS LORENZO FILKINS, M. D.

Instructor in Anatomy and Prosector of Anatomy

JAMES EMMETT HUESTED

Instructor in Materia Medica and Pharmacognosy

LA SALLE ARCHAMBAULT, M. D.

Instructor in Neurology

LEON KAHN BALDAUF, M. D.

Instructor in Bacteriology and Pathology

GEORGE EVERETT BEILBY, M. D.

Instructor in Histology and Surgery

JOSEPH ALOYSIUS LANAHAN, M. D.

Instructor in Dermatology

HARRY RAYMOND, A. B.

Assistant in Dudley Observatory

WILLIAM ATWOOD LARKIN, PH. G.

Instructor in Physics and Chemistry

DANIEL A. YOUNG, B. S. in C. E.

Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.

Instructor in Physical Culture

JAMES H. CUNNINGHAM, B. E.

Instructor in Electrical Engineering

MORLAND KING, B. E., M. E. E.

Instructor in Electrical Engineering

*Union University*

CYRUS A. MELICK, C. E.  
Instructor in Civil Engineering

---

Instructor in Modern Languages

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Instructor in Bacteriology and Pathology

FRANK GEORGE SCHAIBLE, M. D.  
Instructor in Bacteriology and Pathology

ARTHUR FENWICK HOLDING, M. D.  
Instructor in Radiography

HARRY RULISON, M. D.  
Instructor in Clinical Microscopy

MEADE L. ZIMMER, A. B.  
Assistant in Dudley Observatory

ALBERT S. EASTMAN, B. S.  
Assistant in Chemistry

DAVID HUTCHISON, A. M., B. D.  
Assistant in History

## STUDENTS OF UNION COLLEGE

## Abbreviations

*c*, A. B. course; *ls*, Ph. B. course; *s*, B. S. course; *e*, B. E. course in General Engineering; *se*, B. E. course in Sanitary Engineering; *ee*, B. E. course in Electrical Engineering; N. S., North Section; M. S., Middle Section; S. S., South Section; N. C., North College; S. C., South College.

## Candidates for the Degree of Master of Arts

LESLIE NATHAN BROUGHTON, A. B.....*Victor*  
SAMUEL B. HOWE, JR., A. B.....*Plainfield, N. J.*  
LEWIS TIFFANY HUNT, PH. B.....*Schenectady*  
ARCHIBALD HAMILTON RUTLEDGE, B. S.....*Mercersburg, Pa.*  
GEORGE LE ROY SHELLEY, A. B.....*Mercersburg, Pa.*  
MEADE LA FAYETTE ZIMMER, PH. B.....*Dudley Observatory, Albany*

### Graduate Student

C. C. BATCHELDER, B. S.....*Schenectady*, 642 Terrace Pl.

## Seniors, Class of 1907

<i>ee</i>	ANDREW ORDELL AVERY.....	<i>Delanson</i> .....	M. S. N. C.
<i>ls</i>	RAYMOND S. BENNETT.....	<i>Schenevus</i> .....	M. S. N. C.
<i>ee</i>	HOWARD ELMER BISHOP.....	<i>Sayre, Pa.</i> .....	Φ Δ Θ House
<i>e</i>	JAMES G. BRENNAN.....	<i>Albany</i> .....	Δ Φ House
<i>e</i>	HERVEY EDWIN BUTCHER.....	<i>Oneida</i> .....	Ψ Τ House
<i>e</i>	HERBERT EDWARD CANTWELL....	<i>St. Simons Island, Ga.</i>	Φ Γ Δ House



- ee* HUGH GARNETT DAVIS.....*Lynchburg, Va.* Φ Γ Δ House  
*ls* JESSE ABRAHAM DEMEY.....*Sodus*.....S. S. S. C  
*ee* RICHARD SYLVESTER DILLON, JR..*Rensselaer* .....Rensselaer  
*ee* EDWARD JAMES FAIRBAIRN.....*Buffalo*.....A Δ Φ House  
*ee* NICHOLAS V. V. FRANCHOT, 2D..*Niagara Falls*....Σ Φ Place  
*s* HAROLD GARDINER.....*Hadley*.....A Δ Φ House  
*ls* FRED. GIRVIN.....*Schenectady*..708 Westover Ave  
*e* EARL EWAN HARVEY.....*Schenectady*..316 Clinton St  
*s* DUDLEY TOLL HILL.....*Schenectady*..1725 Union St  
*ee* GORDON RUSSELL LANGLEY.....*Schenectady*.....8 Douglas Road  
*e* WALTER T. MCINTOSH.....*Buffalo*.....K A Lodge  
*ee* FRANK LESLIE MOORE.....*French Mountain*  
13 M. S. N. C  
*e* FRED. MUNK.....*Rockville Centre*..S. S. N. C  
*e* FREDERICK WHITMAN NEWTON..*Buffalo*.....K A Lodge  
*ee* ALEXANDER JOSEPH NICHT, JR..*Auburn*.....330 Carrie St  
*c* GEORGE BURTON NOBLE.....*Jonesville*.....X Ψ Lodge  
*ee* D. HENRY OSBORNE, 2D.....*Victor*.....Φ Γ Δ House  
*e* ERNEST BAXTER OSBORNE.....*Chicago, Ill.*.....Σ Φ Place  
*c* LEWIS STEWART PARSONS.....*Liberty*.....Δ T House  
*ee* RICHARD MILTON PYLES.....*Brazil*..704 New Central Ave  
*e* ROLLIN D. REED.....*Binghamton*...Φ Γ Δ House  
*ee* RUBEN C. RODRIGUES.....*Brazil*.....P. O. Box 528  
*ee* RALPH WINNE STEARNS.....*South Berlin*..306 Crane St  
*ee* PETER WILLOUGHBY TRAYNOR...*Owego*.....2 M. S. N. C  
*ee* RALPH TRUMBULL.....*Johnstown*.....Δ Φ House  
*s* CHARLES NEWTON WALDRON....*Detroit, Mich.*..A. Δ Φ House

<i>e</i>	CHARLES RAY WATERS.....	<i>Avoca</i> .....	Φ Δ Θ House
<i>ee</i>	WILLIAM EARL WELLER.....	<i>Schenectady</i> ..	614 Chapel St
<i>c</i>	ALBERT HUNTLEY WHITE.....	<i>Manchester, N. H.</i>	Σ Φ Place

Seniors—35.

Juniors, Class of 1908

<i>e</i>	JOHN L. BACON, JR.....	<i>Elmira</i> .....	Ψ T House
<i>ls</i>	HENRY WINNE BELL.....	<i>Albany</i> .....	K A Lodge
<i>e</i>	JAMES EDWARD BELL.....	<i>Westmoreland</i> ..	Φ Δ Θ House
<i>e</i>	BRADFORD B. BINGHAM.....	<i>Northampton, Mass.</i>	47 Euclid Ave
<i>e</i>	EMANUEL HERBERT BOCIAN.....	<i>Albany</i> .....	10 S. C. N. C.
<i>ls</i>	LOUIS MAYNARD BRYANT.....	<i>LeRoy</i> .....	Δ T House
<i>ls</i>	ARTHUR EDGAR DAVIES.....	<i>Wales, Iowa</i> ..	140 Van Vranken Ave
<i>e</i>	MICHAEL J. J. DWYER.....	<i>Troy</i> .....	Troy
<i>e</i>	JOHN BENJAMIN FLOWERS.....	<i>Schenectady</i> ....	303 Victory Ave
<i>e</i>	DAVID GRANT.....	<i>Green Island</i> ..	Φ Γ Δ House
<i>s</i>	THOMAS EDWARD HANIGAN.....	<i>Schenectady</i> ...	938 State St
<i>e</i>	LEON C. HEILBRONNER.....	<i>Schenectady</i> ..	238 Union St
<i>e</i>	FERDINAND HELM.....	<i>Saratoga</i> .....	Δ Φ House
<i>e</i>	WILLIAM DUELTON HILDRETH...	<i>Herkimer</i> ....	A Δ Φ House
<i>e</i>	LELAND SILAS HOFFMAN.....	<i>St. Johnsville</i> ...	K A Lodge
<i>e</i>	HAROLD WARNER JEWELL.....	<i>Schenectady</i> ..	12 Chestnut St
<i>ls</i>	ARTHUR BEACH KING.....	<i>Troy</i> .....	Σ Φ Place
<i>e</i>	ALEXANDER DORN KLINE.....	<i>Schenectady</i> ..	300 Parkwood Blv'd

<i>e</i>	ALBERT SOUTHARD KNIGHT.....	Round Lake..	B Θ II House
<i>e</i>	ROBERT FULLER MACMULLEN....	Schenectady...	519 Hamilton St
<i>c</i>	AUGUSTINE MARX.....	Amsterdam...	Φ Γ Δ House
<i>ls</i>	WALTER SCOTT McNAB.....	Schenectady..	13 Romeyn St
<i>c</i>	HERMAN LEWIS MEYER.....	Green Island..	Green Island
<i>e</i>	JOHN FREDERICK NASH.....	Plattsburg...	16 M. S. N. C
<i>c</i>	FREDERICK ROYAL PECK.....	Deansboro....	Φ Δ Θ House
<i>e</i>	EDWARD J. PENROSE.....	Cohoes.....	5 S. S. N. C
<i>e</i>	J. STANLEY PRESTON.....	Sharon Springs..	1 S. S. S. C
<i>c</i>	ANDREW VAN VRANKEN RAY- MOND, JR.....	Schenectady..	A Δ Φ House
<i>e</i>	RAYMOND O. SHELLEY.....	Albany.....	Ψ τ House
<i>c</i>	PHILIP FOSTER SHUTLER.....	Utica.....	Φ Δ Θ House
<i>e</i>	FRANK R. STEVENS.....	Albany.....	Ψ τ House
<i>s</i>	ROSS WILLIAMS TIFFANY.....	Schenectady..	131 Furman St
<i>e</i>	CARL H. VOGT.....	Buffalo.....	Φ Δ Θ House
<i>c</i>	MARK SKINNER WATSON.....	Plattsburg.....	Σ Φ Place
<i>ls</i>	MARTIN HENRY WEYRAUCH....	Liberty.....	Δ τ Lodge
<i>e</i>	ROYTON F. WHEADON.....	Johnstown.....	Δ Φ House

Juniors—36.

### Sophomore, Class of 1909

<i>e</i>	FLOYD ELMER ALLEN.....	Elmira.....	9 N. S. N. C
<i>e</i>	STANLEY C. BAYLESS.....	Binghamton....	Ψ τ House
<i>e</i>	THOMAS BERNARD BERGAN.....	Auburn....	South Colonnade
<i>e</i>	WILLIAM WALDO BROWN.....	Brooklyn.....	Ψ τ House

e	ROBERT L. BRUNET.....	Petersburg, Va..	Σ Φ Place
e	CLARENCE E. BURLEIGH.....	Plattsburg....	3 S. S. N. C
e	FRANCIS WILLIAM BURLEIGH....	Plattsburg....	3 S. S. N. C
e	C. EDGAR BURTON.....	New York City.....	
		619 Union St	
ls	JAMES BRADIN CHAPMAN.....	Broadalbin.....	Δ Φ House
e	PHILIP HATHAWAY CLARK, JR....	Kingston.....	Φ Γ Δ House
e	WILLIAM FRANCIS COLLINS.....	Petersburg, Va..	M. S. N. C
ls	C. ROSCOE FAILING.....	Palatine Bridge.	M. S. S. C
s	JOHN WILLIAM FAUST.....	Schenectady.....	19 Jay St
e	RAYMOND J. FINCH.....	Alpine.....	1 M. S. N. C
e	LEON BURHAUS FOOTE.....	Whitehall....	Φ Γ Δ House
s	DOANE SINCLAIR GUARDENIER....	East Springfield.....	
		Φ Δ Θ House	
ls	JOHNSON POTTER HALLENBECK....	Hoffmans....	Φ Γ Δ House
s	HARRY D. HANFORD.....	Unadilla....	10 M. S. N. C
e	EDWARD EVERETT HARKNESS.....	Harkness..	15 M. S. S. C
e	SEWARD DANIEL HENDRICKS.....	Sodus.....	Φ Δ Θ House
e	FRANK EVERETT HUNTINGTON....	Keuka....	North Colonnade
e	RAYMOND M. JOLLEY.....	South Bethlehem.	Δ Φ House
e	HENRY EDWARD LEWIS.....	Ballston Spa....	Ψ Υ House
s	LOUIS FRANKLIN MAUGHAM....	Tenafly, N. J..	Φ Δ Θ House
c	ROY HAMILTON McCORMACK.....	Delmar.....	1 Beaver St
e	JOHN JOSEPH McCORMICK, JR....	Troy.....	Δ Υ House
e	CROMWELL McINTOSH.....	Buffalo.....	K A Lodge
e	CHARLES LAWRENCE MEAD.....	Sault Sainte Marie, Mich.	
		A Δ Φ House	
ls	WARD WINTHROP MILLIAS.....	Castleton-on-Hudson	
		622 Hamilton St	

<i>c</i>	ELMER WALLACE K. MOULD.....	<i>Green Island</i> ..	124 Front St
<i>e</i>	J. ELLIOTT PARRY.....	<i>Glens Falls</i> ....	K A Lodge
<i>e</i>	HOWARD SYLVESTER PARSONS....	<i>Albany</i> .....	Δ T House
<i>s</i>	JONATHAN PEARSON.....	<i>Hudson</i> .....	713 Union St
<i>e</i>	LEO H. PERRY.....	<i>Herkimer</i> ....	Φ Γ Δ House
<i>c</i>	FRED WILBUR PETTIT.....	<i>Avoca</i> .....	Φ Δ Θ House
<i>e</i>	CEDRIC POTTER.....	<i>Omaha, Neb</i> ....	X Ψ Lodge
<i>s</i>	CHESTER LELAND RANKIN.....	<i>Schenectady</i> ..	1202 State St
<i>s</i>	DANIEL TOBIAS READ.....	<i>Monck's Corner, S. C.</i>	
			B Θ II House
<i>c</i>	GEORGE W. ROOSA.....	<i>Buffalo</i> .....	Δ T House
<i>c</i>	ROSCOE HALL SAMMONS.....	<i>Sammonsville</i> ..	Δ Φ House
<i>e</i>	HARRY A. SCHAUPP.....	<i>Albany</i> .....	Ψ T House
<i>e</i>	HERBERT DAVIS SCHUTT.....	<i>Schenectady</i> .....	
			124½ Nott Terrace
<i>e</i>	PIERRE J. SIMKINS.....	<i>Amsterdam</i> ..	Φ Γ Δ House
<i>e</i>	HAROLD ERNEST STARBUCK.....	<i>Gouverneur</i> ..	B Θ II House
<i>e</i>	BURR MANLOW STARK.....	<i>Gloversville</i> ..	5 M. S. N. C
<i>c</i>	ARTHUR J. STREIBERT.....	<i>Albany</i> .....	Δ T House
<i>ls</i>	ALVIN URY.....	<i>Schenectady</i> ..	143½ Barrett St
<i>ls</i>	RALPH J. URY.....	<i>Schenectady</i> ..	143½ Barrett St
<i>c</i>	CARL WACHTER.....	<i>Green Island</i> ..	124 Front St
<i>s</i>	OTTO JEAN WALRATH.....	<i>Gloversville</i> ..	7 M. S. N. C
<i>e</i>	J. LESLIE WALTON.....	<i>Schenectady</i> ..	947 State St
<i>c</i>	JAMES BELL WELLES.....	<i>Geneseo</i> .....	Δ Φ House

Freshmen, Class of 1910

s	WILLIAM A. ACKROYD.....	Albany....	306	Clinton Ave Albany
e	HENRY WILLIAM ALBING.....	Buffalo.....	836	Union St
e	WILLIAM JOSEPH ANDERSON.....	Gansevoort...I.	N. S. N. C	
ls	ROLAND MILLER BARTLETT.....	Glendale, Mass..	N. S. N. C	
e	WALTER J. BECKER.....	Altamont..	147	Nott Terrace
e	ZACARIAS BORBA.....	Brazil...219	Seward Place	
e	REX VAN BORNSTEIN.....	Cobleskill...316	Clinton St	
e	JOHN HAMMOND BOVIER.....	Elmira.....	N. S. N. C	
s	PERLEY HENRY BUCK.....	Schenectady..	11	N. College St
s	ALBERT EDWARD CARMICHAEL....	Schenectady..	201	Union St
c	SAMUEL MCCREA CAVERT.....	Ballston Spa...173	Nott St	
ls	WILLIAM LANE CAVERT.....	Ballston Spa...173	Nott St	
c	ARTHUR RUSSELL CHAFFEE.....	Morristown...5	M. S. N. C	
e	JOHN G. CHAREST.....	Schenectady..	12	Barrett St
e	KENNEDY CONKLIN.....	New York City..	X	Ψ Lodge
s	HARRY GABRIEL COPLON.....	Troy....517	So. Centre St	
e	FRANK CLAIR DAVERN.....	Marathon....11	M. S. N. C	
e	ARCHIBALD R. DENNIS.....	Kalamazoo, Mich.		A Δ Φ House
e	GEORGE A. DILLINGER.....	Ithaca.....	S. S. N. C	
e	RAYMOND C. DILLINGHAM.....	Denver, Colo...X	Ψ Lodge	
e	EVERETT J. DUNN.....	Brier Hill....9	M. S. N. C	
c	ARCHIE EDWARD EVANS.....	Brooklyn.....783	Nott St	
s	WILLIAM FERGUSON.....	Oneida.....	Ψ	τ House
e	JAY STUART FREEMAN.....	Schenectady...40	Glenwood Boulevard	



- c* FRANK M. GALLAGHER.....*Butte, Montana.* Ψ Υ House  
*c* JOHN CARY GARRETSEE.....*Lancaster.* 9 S. S. S. C  
*e* HARLAN HAVILAND GROVER.....*Glens Falls.* Δ Υ House  
*e* MACY ORSEN HALLOCK.....*Rochester.* B Θ II House  
*e* LOUIS ALBERT HEQUEMBOURG....*Schenectady.* 22 Gillespie St  
*c* ADAM JOHN HORN.....*St. Johnsville.* 12 N. S. N. C  
*s* J. MASON HOTCHKISS.....*Schenectady.* 70 Union Ave  
*c* BURTON HOUK.....*Schenectady.* 507 Craig St  
*s* HORACE KING HUTCHENS.....*Pulaski.* A Δ Φ House  
*e* STRICKLAND K. HYDE.....*Hackensack, N. J.* A Δ Φ  
House  
*ls* EDWARD B. IRISH.....*Schenectady.* 48 Euclid Ave  
*e* HENRY BERGER KECKELEY.....*Charleston, S. C.* 2 Φ Place  
*e* WILL T. KELLER.....*Portville.* 9 M. S. N. C  
*e* STEPHEN D. KELLEY.....*Saratoga Springs.* B Θ II House  
*e* ANDREW VINCENT KELLY.....*Albany.* 28 Jefferson St  
Albany  
*e* ARNOLD EDWARD KRIEGSMANN...*Schenectady.* 19 Wendell  
Ave  
*s* WILLIAM H. LADUE.....*Plattsburg.* 28 Union Ave  
*e* CHARLES FITCH LANDSHEFT.....*Buffalo.* Φ Δ Θ House  
*c* HAROLD A. LENT.....*Highland.* Φ Δ Θ House  
*e* HARRY MACCONNELL LEON.....*Little Falls.* Ψ Υ House  
*e* EBEN JOSEPH LONG.....*Youngs.* 783 Nott St  
*s* HOWARD MACOMBER.....*Delanson* Delanson  
*ls* CHARLES FREDERICK MACGILL, JR*Pittsfield, Mass.* A Δ Φ House  
*e* M. VINCENT McDONALD.....*Shenandoah, Pa.* 703 Union  
St  
*s* ROBERT H. McEWEN, JR.....*N. Lawrence.* Φ Γ Δ House



- e* JOHN J. McMANUS.....*Albany*..480 Hudson Ave.,  
Albany
- c* WILLIAM B. NEILSON, JR.....*Mechanicville*...Δ Φ House
- c* LEROY COON NIMMO.....*Rutland, Vt.*...M. S. S. C
- c* ROSCOE ALMOND PAUL.....*Richmondville*..424 Liberty  
St
- c* WILLIAM EDWARD PAUL.....*Richmondville*..424 Liberty  
St
- ls* LEO B. PEARSALL.....*Sodus*.....Δ τ House
- s* ARTHUR CUTHBERT POTTER.....*Omaha, Neb.*...X Ψ Lodge
- c* EDWARD DELAVAN RANSOM.....*Albany*.....A Δ Φ House
- e* JAMES THOMPSON REID.....*Bennettsville, S. C.*  
N. S. N. C
- e* LLOYD NASH ROBINSON.....*Albany*.....Δ τ House
- s* LEO DAVID ROTHENSIES.....*Walton*.....7 N. S. N. C
- e* HAROLD E. SCHEPER.....*Hendersonville, N. C.*...  
N. S. N. C
- s* SAMUEL B. SCHWARZWAELDER....*Chichester*....X Ψ Lodge
- e* HAROLD E. SEAMANS.....*Marathon*....Φ Δ Θ House
- c* RICHARD PARSONS SEARS.....*Buffalo*.....A Δ Φ House
- e* RAYMOND SEEM.....*Elmira*.....Silliman Hall
- e* ROBERT BLANCHARD SHEPARD....*Hudson*.....A Δ Φ House
- e* AARON H. SHERMAN.....*Albany* .....Albany
- c* AUGUSTUS KELLOGG SLOAN, JR..*Brooklyn*.....703 Union St
- e* NEWTON WALDRON SLUTTER....*West Seneca*....Σ Φ Place
- e* CARSON EDWARDS SMITH.....*Herkimer*.....Ψ τ House
- e* HENRY P. STEWART.....*Bath*.....X Ψ Lodge
- e* DANIEL J. SULLIVAN.....*Elmira*.....313 Seward Pl
- s* ALFESTUS SPERLING THOMAS....*New Bern, N. C.*.....  
16 Univ. Pl



- (09 s) WINFRED MACBAIN CORBIN..*Binghamton*.....Σ Φ Place
- (08 e) WILLARD D. COVEY.....*Lyon Falls*....N. S. N. C
- (08 s) WILLIS D. CURTISS.....*Sodus*.....Δ T House
- (08 e) CORNELIUS ERNEST ELMEN..*Coeymans Hollow*  
DORF ..... B Θ II House
- (08 e) ERNEST JOHNSON FULLER..*Warwick*.....K A Lodge
- (08 ls) CHESTER G. FULLERTON....*Schenectady*..6 Chestnut St
- (09 e) HARRY BURTON FURNSIDE..*Schenectady*, B Θ II House
- (08 e) EUGENE WATSON GOFF....*Plattsburg*.....Δ T House
- (09 e) GEORGE C. S. HALLA.....*Troy*.....Φ Δ Θ House
- (08 c) HIRAM THOMAS HILDRETH..*Middleville*..A Δ Φ House
- (08 e) HAROLD LANSING KEITH...*Schenectady*..1030 State St
- (09 e) EMIL KIESSLING.....*New York City*.....  
3 M. S. N. C
- (08 ls) EDWIN L. LACROSSE.....*Schenectady*..7 Chestnut St
- (08 e) ARTHUR LEWIS LAROCHE..*Binghamton*...Ψ T House
- (09 s) HERBERT HECTOR MERRILL..*Schenectady*....X Ψ Lodge
- (09 e) RALPH STETSON MERRILL..*Gloversville*....Δ Φ House
- (08 s) JAMES P. MINAHAN.....*Schenectady*..706 South Ave
- (07 e) BENJAMIN NOX MOOERS...*Plattsburg*.....Σ Θ Place
- (09 e) CHESTER MOORE.....*Horseheads*...3 M. S. N. C
- (09 e) CHARLES MORRIS.....*Auburn*..South Colonnade
- (08 e) ARBA ROMANS MORSE.....*Sidney Centre*....134 Park  
Place
- (08 e) CHARLES FRANKLIN MUL-  
ROONEY .....*Albany*....237 Park Place
- (08 s) LEVI PARSONS .....*Gloversville*....K A Lodge
- (07 e) ELROY SHIBLEY REEDER...*Binghamton*...Ψ T House
- (07 e) GLENN ELLISON RICHARD-  
SON .....*Herkimer*.....Ψ T House



## STUDENTS OF THE ALBANY MEDICAL COLLEGE

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### Fourth Year Class

CHARLES SANFORD ALLEN, 2d.....	Rensselaer
FLOYD JEROME ATWELL.....	Oaksville
GEORGE WARREN BEEBE.....	Johnstown
JOSEPH LEWI BENDELL, A. B.....	Albany
EDWARD GEORGE BENSON.....	Albany
HOWARD PHILIP CARPENTER.....	Highland
WILLIAM DAVID COLLINS, A. B.....	Green Island
ERASTUS CORNING, A. B.....	Albany
MARCUS DENIS CRONIN.....	Wilton
WALTER THOMAS DIVER.....	Troy
JOSEPH LEWI DONHAUSER, A. B.....	Albany
JAMES WILLIAM FLEMING.....	Little Falls
EDWARD HERMAN FREDERICK FRISCH.....	Buffalo
ALFRED THOMAS GABRIELS, A. B.....	Watervliet
LOUIS HERBERT GAUS.....	Albany
MORRIS HERBERT GOLDMAN.....	New York
NORMAN CHARLES GOODWIN, A. B.....	Albany
ALFRED WOODWARD GROVER.....	Kingston, Pa
ALEJANDRO BUITRAGO GUILLIOD.....	New Paltz
AUGUSTUS JOSEPH HAMBROOK.....	Cohoes
EDWARD WILLIAM JACKSON.....	Little Falls
DEAN WARDELL JENNINGS.....	Cairo
CLARENCE ROBERT KAY.....	Amityville

ROY CHARLES KEIGHER.....	Schenectady
DAVID KIDD.....	Troy
RICHARD ANDREW LAWRENCE, A. B. ....	Albany
TIFFANY LAWYER .....	Albany
JACOB HENRY LINDEN .....	Sharon Springs
ROBERT SUTTENFIELD LIPES.....	Albany
JAMES EDWARD MALONEY.....	Albany
JOHN SEARS MCCORMACK.....	Albany
JEROME MEYERS, A. B.....	Albany
WILLIAM ALOYSIUS OBERLE.....	Newark, N. J
ZENAS VAN DUZEN ORTON.....	Northampton
GEORGE POLANER.....	Newark, N. J
WILLIAM CLARE PORTER.....	Lestershire
STEPHEN JOHN HENRY REED.....	Schenectady
FRED JAMES RICE.....	Canajoharie
JAMES TERRANCE RILEY.....	Oklahoma City, Okla
LIONEL ROSENBERG.....	Brooklyn
FRANK JACOB SCHWARTZ.....	New York
FREDERICK SEILHEIMER .....	Buffalo
JAMES JOSEPH SHEA.....	Hoosick Falls
WILLIAM CARL TREDER, PH. B.....	Albany
HERBERT JOHN WRIGHT .....	Rhinebeck

Fourth Year Students—45.

### Third Year Class

EARL ERRET BABCOCK.....	Deer River
FREDERICK J. BARNET.....	Albany

WILLIAM EDWARD BARTH.....	Schaghticoke
JOHN ADKINS BATTIN.....	Watervliet
HARTLEY EDWARD BOOROM.....	Interlaken
SAMUEL PIERSON BRUSH.....	Troy
EUGENE HOWARD BURNES.....	Amsterdam
WILLIAM HENRY CONGER, JR.....	Delmar
JOSEPH DAVIS.....	High Falls
NELSON KAUFMAN FROMM, A. B.....	Albany
EARL WILLIAM FULLER.....	Utica
FRANK GARTEN.....	Albany
JOHN ROUSE GILLET, A. B.....	Albany
EDWIN FRANCIS HAGEDORN.....	Gloversville
ROSSLYN PHILIP HARRIS.....	Delanson
STANTON PERRY HULL.....	Berlin
JACOB TRAVERS KRAUSE.....	Schenectady
ALEXANDER MITCHELL LOEWENSTEIN.....	Troy
JOHN JOSEPH ALOYSIUS LYONS, PH. G.....	Albany
ROBERT DANIEL MANNING.....	Mohawk
CHARLES GIBSON MCGAFFIN, PH. B.....	Cohoes
GEORGE BOLTON McMURRAY.....	Troy
ROBERT COPELAND MOONEY.....	Gloversville
WILLIAM LESLIE MUNSON.....	Granville
JOHN PAUL O'KEEFFE.....	Hadley
CHARLES BATES PHILLIPS.....	Gloversville
GEORGE PHILO PITKIN.....	Schroon Lake
MILTON WOOLLEY PLATT.....	Albany
JOHN JOSEPH RAINEY.....	Troy



EDWARD JOHN RILEY.....	Rensselaer
BERT WILLIAM ROY, A. B.....	Clyde
GEORGE STEPHEN SILLIMAN, A. B.....	Stockport
RAY ERNEST SMITH.....	Rutland, Vt
AARON SOBEL.....	Newburgh
HERBERT EDGAR SPERRY.....	Penfield
WILLIAM JAMES THOMPSON.....	Oneonta
EDWARD EVERETT TREDWAY, A. B.....	Gloversville
JOSEPH EDWARD WINDBIEL.....	Amsterdam
JOHN WINGATE.....	Princetown
PAUL VIRGIL WINSLOW.....	Warwick
CALVIN BASSLER WITTER.....	Albany

Third year students—41.

### Second Year Class

EDWARD JOHNSON ABBOTT, A. B.....	Albany
MORRIS BELLIN.....	Albany
WILLIAM ARTHUR BING.....	Castleton
LEWIS WEBSTER BURDICK, B. S.....	Maryland
WILLIAM FRANCIS CONWAY.....	Albany
WILLIAM HENDERSON DAVIDSON, A. B., Pd. B.....	Cohoes
EDWARD DANIEL DONOHUE.....	Glens Falls
HARRY HOUGHTON DRAKE.....	Albany
ORLA ANDREW DRUCE.....	Fulton
WAKEMAN CLARK EGERTON, A. B.....	Albany
GILBERT CHARLES FISK.....	Albany
HENRY BLACKLIDGE GILLEN.....	Cohoes

WILLIAM BREESE GILLESPIE.....	Saranac Lake
ELWIN WALLACE HANNOCK.....	Saratoga Spa
EDDY STEARNS HASWELL.....	Albany
PETER AUSTIN HAYDEN, A. B.....	Cohoes
HARLEY HEATH .....	Warrensburgh
THOMAS MILTON HOLMES, B. S.....	Albany
CHARLES VINCENT KEATING.....	Matteawan
ELLIS KELLERT .....	Albany
CHARLES JAMES KELLEY.....	Cortland
ROBERT SCHOFIELD LONG.....	Frankford, Del
WILLIAM JOSEPH LUDDEN.....	Troy
EUGENE FRANCIS MCGILLIAN.....	Green Island
JAMES GIBBONS MCGILlicuddy.....	Glens Falls
THOMAS ANDREW McGRATH.....	Hoosick Falls
BURLIN GEORGE MCKILLIP.....	Oliverea
FREDERICK WILLIAM McSORLEY.....	Malone
EDWARD RAYMOND MESSER.....	Pittsfield, Mass
ALEXANDER FRANCIS MOSHER.....	Glens Falls
NEIL BERTRAM PALEN.....	Albany
ARTHUR EMERSON PITTS.....	Cohoes
AUGUSTUS CHARLES POST.....	Catskill
WILLIAM RUFUS RATHBUN.....	East Springfield
WILLARD TIPPLE RIVENBURGH.....	Ghent
CLARENCE LEONARD RUSSELL.....	Deposit
CHARLES EMERSON SLATER.....	Cairo
LEONIDE GEORGE SUPRENANT.....	Cohoes
FREDERICK EUGENE VAUGHAN.....	Gloversville

WALTER HARRY WATERBURY.....East Nassau

JAMES JOSEPH YORK.....Watervliet

Second year students—41.

### First Year Class

WILLIAM DAVID ALDRICH.....Wevertown

DOUGLAS CLARK ALLEN.....Altamont

WILLIAM DEWEY ALLEN.....Rensselaer

WILLIAM BENEDICT ANDERSON.....Troy

WARDNER DANIEL AYER.....Rensselaer

JOHN FREDERICK BEIERMEISTER.....Troy

LEROY HERBERT BENDER.....Utica

GEORGE BIBBY .....Pottersville

CLAUDE BLEDSOE.....Gloversville

GEORGE CLAYTON BRUNELL.....Albany

CORNELIUS JOSEPH BUCKLEY, A. B.....Pittsfield, Mass.

JOHN BENNETT BURKE.....Troy

JAMES WHITFIELD BYRNE.....Troy

FRANK GIBSON CALDER.....Freehold

DENNIS JAMES CARROLL.....North Hebron

EUGENE FRANCIS CONNALLY.....Troy

ARTHUR GEORGE COOK.....Gloversville

THEODORE JAMES COOPER.....Black River

JOHN RICHARD DEVINE.....Troy

GEORGE WATSON DUFTY.....Troy

JOHN HENRY ENGLISH.....Colonie

JOHN ARTHUR FARRELL, JR.....Rensselaer

SAMUEL FRIEDMAN.....	Schenectady
GEORGE MILLS GLENN.....	Fonda
RICHARD BERCHMANS GRAY.....	Rensselaer
GEORGE AGUSTINE GREEN.....	Mechanicsville
HENRY MARTIN GROGAN.....	Warrensburg
PHILIP CONRAD HACKER.....	Albany
MATTHEW DOMINIC HARRIS.....	Ilion
JAMES CHARLES HASSALL.....	Troy
PATRICK JOSEPH HIRST.....	Mechanicville
WILLIAM KNOWLTON JOHNSON.....	Schodack Landing
WALTER SCOTT LILIENTHAL.....	Albany
HARRY SANFORD LOCKWOOD.....	Fonda
CHARLES IMMANUEL LOEBLE.....	Troy
HAROLD ARTHUR LUCAS.....	Rensselaer
WALTER EDWARD LUNDBLAD.....	Schenectady
HAROLD MACDONALD.....	Watervliet
EDWARD BARTHOLOMEW MANION.....	Herkimer
ROY JAY MARSHALL.....	Gouverneur
WILLIAM HENRY MASON.....	Gloversville
JOHN JAMES MCCALL.....	Albany
WILLIAM EDWARD MCCORMICK.....	Albany
JOHN THOMAS MCGIVERN.....	Castleton
WALTER DANIEL MCKENNA.....	Troy
MARSHALL DOIG MCNAUGHT.....	Delancy
JOSEPH AMBROSE MCPHILLIPS.....	The Glen
JOHN JAMES MCSHANE.....	Springfield Center
HOWARD CASPER MURRAY.....	Herkimer

CHARLES FREDERICK MYERS.....	Saratoga
ABRAHAM LEWIS OLSHANSKY.....	Albany
CHAUNCEY BUTLER PACKARD.....	Troy
DUNCAN MACGREGOR PARSONS.....	Gloversville
GEORGE BRADFORD RANDALL.....	Ballston Spa
LEANDER GEORGE RYMPH.....	Port Ewen
WILLIAM THOMAS SHIELDS, JR.....	Albany
JOHN FORREST SOUTHWELL.....	Keene, N. H.
JOHN ALBERT SULLIVAN.....	Pittsfield, Mass.
PHILIP SWARTZ.....	Albany
HAROLD AUGUSTUS TRAYNOR.....	Brushton
WILLIAM TROTTER.....	Troy
HARRY FRANKLIN VAN LOON.....	Albany
LLOYD CYRUS WARREN.....	Colchester
ARTHUR FRANCIS WELD.....	Saranac Lake
ARTHUR HASTINGS WHEELER.....	Troy
JOHN EDMUND WHITE.....	Philmont
IRA CONDUCT WHITEHEAD, JR.....	Albany

First year students—67.

## STUDENTS OF THE ALBANY LAW SCHOOL

---

Senior Class

BENJAMIN I. ALLEN.....	Plattsburg
HOWARD T. BARNES.....	Orwell, Pa
WILLIAM L. BELKNAP, JR.....	Bridgeport, Conn
JAMES J. BRITT.....	Albany
J. STANLEY CARTER.....	Cohoes
THOMAS J. CROSS.....	Rome
ARTHUR F. CURTIS.....	Deposit
CHARLES J. DUTTON.....	Westerly, R. I
WM. H. EARL.....	Lockport
EDWARD W. EATON.....	Waverly
GEO. W. FEATHERSTONHAUGH, JR., A. B., UNION, ...	Schenectady
DAVID S. FISK.....	Jay
THOMAS J. FITZPATRICK.....	Plattsburg
ROBERT W. FIVEY.....	Albany
OLIVER J. FLYNN.....	Albany
ROLAND J. FORD.....	Albany
CHARLES H. GARDNER.....	Baldwinsville
JOHN L. GIBEAU.....	Cohoes
JOHN F. GLEASON.....	Albany
LEONARD A. GOVERN.....	Stamford
WARNER A. GRAHAM.....	Hartwick, Vt
AUSTIN B. GRIFFIN.....	Davenport
EDWARD J. HALTER.....	Albany
CHARLES H. HERRICK.....	Manchester

WYCKOFF HOXIE .....	Auburn
W. MURRAY JONES.....	Fayette, Ala
EDWARD M. KENNEDY.....	Troy
ROSE KINGSLEY.....	Kingston
EDWARD A. LAWLESS.....	New London, Conn
JOHN J. LIVINGSTON.....	Heuvelton
FRANK P. MCARDLE.....	Albany
GEORGE A. MCARDLE.....	Albany
JOSEPH L. MCENTEE.....	Albany
JOHN J. MCGRAIL.....	Albany
EDWARD A. MEALEY.....	Cohoes
CLARENCE A. MEEKER.....	Carthage
ROSCOE R. MITCHELL.....	Cohoes
HOWARD D. MOSHER.....	Troy
WILLIAM H. MURRAY.....	Troy
DALLAS C. NEWTON.....	Geneseo
WILLIAM F. NEWTON.....	Geneseo
FRANK S. NICHOLSON.....	Middleport
HAROLD F. PORTER.....	Carthage
O. GATES PORTER.....	Athens
OSCAR M. QUACKENBUSH.....	Oneonta
ISADOR SAMPSON.....	Kingston
PETER C. SCHEMERHORN.....	Brooklyn
ARTHUR J. SMITH.....	Albany
JAMES W. SMITH.....	Troy
GRANT L. STANFORD.....	Schenectady
JAMES R. STEVENS, JR., PH. B., UNION.....	Cohoes



OGDEN STEVENS .....	Albany
CARL H. STUBIG .....	Schenectady
GRANVILLE D. STUBBS.....	Danbury, Ct
CHARLES B. SULLIVAN.....	Albany
HOWARD W. TAYLOR.....	Malone
ALEXANDER J. THOMSON, PH. B, UNION.....	Schenectady
JESSE S. WICKS.....	Bainbridge
BARRET R. WELLINGTON.....	Troy
FRED W. WOSE.....	Albany

Seniors—60

### Junior Class

RAFAEL MARTINEZ ALVAREZ.....	Porto Rico
JOHN BATES.....	Oneida
WILLIAM F. BELL.....	East Worcester
EDWARD H. BENNETT.....	Pulaski
MAX BOYER .....	New London, Conn
EDWARD BRODY .....	New York City
EDWARD E. BROGAN.....	Dansville
HENRY M. BROWN.....	Geneva
JOSEPH W. BRYAN.....	Auburn
JOHN W. BURROWS.....	Harpersville
PERKINS F. CADY.....	Hudson
CHARLES L. CANTON.....	Newtonville
FRANCIS B. CANTWELL .....	Malone
CLARK CIPPERLY .....	Troy
PHILIP L. CLASSEN, A. B., UNION.....	Albany

WILLIAM T. CLUTE.....	Rensselaer
JAMES J. COATES.....	Albany
HARRY COOK, A. B., UNION.....	Albany
CHARLES E. J. COYLE.....	Albany
CHARLES H. DENNIS.....	Boonville
WILLIAM A. DUNNE.....	Troy
MAXIM DREFKOFF.....	Warsaw, Poland
MALCOLM R. EVERS.....	Waterford
IDA M. FEARON.....	Morrisville
HAROLD E. FRITTS.....	Hudson
RALPH W. FRANCE.....	Windham
MORRIS I. FRANKLIN.....	Albany
DELESLIE V. GAIGE.....	Morrisville
WILLIAM GRAF .....	Hudson
SEELEY V. HAMILTON.....	So. Glens Falls
ROSCOE HARPER .....	Waddington
FRANCIS J. HURLEY.....	Albany
ELI M. JONES.....	Elba
DENNIS J. KILKENNEY.....	West Oneonta
GEORGE M. LEPINE.....	Unadilla
LEON R. LEWIS, B. S., UNION.....	Gilboa
CLAUDE H. LEYFIELD.....	Schaghticoke
J. HARRIS LOUCKS.....	Feura Bush
ALLEN R. MACDONALD.....	Albany
HERRICK, MCCLENTHEN, B. S., UNION.....	Jefferson
JAMES R. McDONOUGH.....	Albany
JAMES C. McMAHON.....	Port Henry

H. D. MARSHALL.....	Geneva
RAYMOND H. MOODY.....	Binghamton
WENDOVER NEEFUS.....	Hudson
MERWIN H. NELLIS.....	Albany
FLOYD W. POWELL.....	Kingston
HUGH J. REILLY.....	Albany
JOHN H. RING.....	Cohoes
EDWARD F. RONAN.....	Binghamton
GLADYS M. ROSEBROOK.....	Albany
FRANK S. STEPHENS.....	Albany
CHARLES P. STEWART.....	Kingston
WILLIAM E. THORPE.....	Catskill
FRED A. TORRANCE.....	Jay
BARTON C. WARREN.....	Cooymans
CHARLES R. WATSON.....	Binghamton
WALTER F. WELLMAN, A. B., UNION.....	Schenectady
FAY H. WHITE.....	Cohocton
TOWNSEND K. WELLINGTON.....	Troy

Juniors—60.

**STUDENTS OF THE ALBANY COLLEGE OF  
PHARMACY**

---

**Senior Class**

ROBERT FAULKNER AVERY.....	Hunter
LE ROY CHESTER BAKER.....	Champlain
WILLIAM LAWRENCE BAKER.....	Mechanicville
WILLIAM HENRY CANFIELD.....	Hoosick Falls
LEO EDWARD CAREY.....	Greenwich
CICERO GEORGE CLIFFORD.....	Burlington, Vt
STEPHEN EMERY COOK.....	Ballston Spa
BERNARD FRANCIS DONAHUE.....	Norwood
KATHERINE BENEDICTA DONOHUE.....	Albany
JOHN HENRY DROMEY.....	Canton
WILLIAM BARTHOLOMEW FOODY.....	Rensselaer
FERDINAND HARVARD FRANCHOIS.....	Albany
PERCY SANFORD HAINES.....	Kingston
JOHN LEONARD HARRINGTON.....	Oneonta
WALTER CHARLES KLAPPER.....	Schenectady
FRED SMITH LEATHERS.....	Hudson
IDA LOUISE MOORE.....	Albany
ALVAH HARDINBURG PLACK.....	Schenectady
WILLIAM MORISSEY PRATT.....	Albany
WILLIAM NORTHOP PURPLE.....	Albany
HAROLD HUBER RELLER.....	Albany
EDWARD CHARLES RETALLICK.....	Canajoharie
MILTON PIERCE TUPPER SANDFORD.....	Greene

MAX ALBRECHT SHOEMAKER.....	Waverly
IRA WALKER SMITH.....	Nicholville
FREDERICK JAMES STEPHENS.....	Waterford
JOSEPH EDWARD SWEENEY.....	Ballston Spa
STUART CARROLL TAYLOR.....	Luzerne
WILLIAM ARCHIBALD TOWNSEND.....	Glens Falls
ELMER JAMES VAN TASSELL.....	Kingston
CHARLES PALMER WHITE.....	Strondsburg, Pa
STANLEY GEORGE WHITE.....	Schenectady

Seniors—32.

### Junior Class

JOSEPH AUGUSTUS BABCOCK.....	Greenwich
JOHN NATHAN BOLT.....	Unadilla
WILLIAM RICHARD BRADLEY.....	Sharon Springs
CLYDE FREDERICK BRANDY.....	Ogdensburg
HENRY MILLINER BROWN.....	Plattsburg
CHARLES AUSTIN BUCHANAN, JR.....	Amsterdam
GORDON ALFRED FITCH.....	Thompson, Mich
ARTHUR MARTIN FRINK.....	Gloversville
MILFORD EUGENE FROST.....	Waterford
CLIFFORD ADELBERT HEWITT.....	Hoosick Falls
WALTER JOHN JOSEPH HOPE.....	Schenectady
LEON AUGUSTUS LINES.....	Homer
ALBERT JAMES McCAFFREY.....	Nicolet, P. Q., Canada
GEORGE WALLING McELROY.....	Albany
WALTER LINN MURDOCK.....	Flycreek

EDWARD GRESHAM NELSON.....	Albany
BEULAH RUTH NORTON.....	Fair Haven, Vt
AIMEE HOLLETT PALMATIER.....	Albany
FRANK SMITH PARK.....	Woodhull
JOHN CLAIR PARKER.....	Deposit
DANIEL FORD RASBACH.....	Mohawk
ROCCO SPINA .....	Utica
HARLEY RICHARD STREETER.....	Fair Haven, Vt
JAMES CHARLES THORNTON.....	Marcellus
EUGENE WHELOCK VEEDER, JR.....	Schenectady
FRANK S. VISSCHER.....	Little Falls
HARRY SCHERMERHORN WALKER.....	Schenectady
CHARLES EARL WEIDMAN.....	Marcellus
ERNEST WARREN WELLS.....	Scotia
HENRY JACOB WILDHACK.....	Utica
ERFORD LLOYD WOOD.....	Delhi

Juniors—31.

### Summary of Students, Union University

Union College .....	256
Albany Medical College .....	194
Albany Law School .....	120
Albany College of Pharmacy .....	63
Total.....	633

UNION COLLEGE

SCHENECTADY, N. Y.

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ACADEMIC DEPARTMENT OF

UNION UNIVERSITY



UNION COLLEGE

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Union College was incorporated by the Regents of the University of the State of New York on the 25th day of February, 1795. It was the second college incorporated in the State, and the first north of the city of New York and west of the Hudson River. It received its name from the circumstance that several religious denominations co-operated in its organization, and was the first college in the United States which was not of a strictly denominational character. It has continued from its foundation to be a representative institution of Christian unity.

The first president of Union College was the Rev. John Blair Smith, of Philadelphia. He was elected in 1795, and resigned in 1799, only a few months before his death. He was succeeded by Jonathan Edwards, the younger, who died in 1801. The Rev. Jonathan Maxcy, previously president of Brown University, succeeded Dr. Edwards, and resigned at the end of two years. In 1804 the Rev. Eliphalet Nott was elected president of Union College, which office he held until his death, on the 29th day of January, 1866. The Rev. Laurens P. Hickok, a graduate of the College, who had long acted as vice-president, was elected his successor. He resigned in 1868. The Rev. Charles A. Aiken succeeded Dr. Hickok in 1869, and resigned in 1871. The Rev. Eliphalet Nott Potter was elected president in 1871, and inaugurated June 20, 1872. On his resignation, in 1884, the Hon. Judson S. Landon, LL.D., was appointed president *ad interim*, and served until the inauguration of Harrison E. Webster, LL. D., who was elected president May 23, 1888, and inaugurated June 26, 1888. On his resignation, in January, 1894, Rev. Andrew V. V. Raymond, D. D., LL. D., was elected president, and inaugurated in June, 1894.

## OFFICERS OF UNION COLLEGE

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REV. GEORGE ALEXANDER, D. D., 10th street and University place, New York.  
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HON. NICHOLAS V. V. FRANCHOT, A. M., Olean.  
HON. GEORGE F. SEWARD, LL. D., 97 Cedar street, New York City.  
EDWIN W. RICE, JR., PH. D., Sc. D., Schenectady, N. Y.  
EDWARD P. WHITE, A. M., Buffalo, N. Y.  
CHARLES E. SPRAGUE, PH. D., Union Dime Savings Bank, New York.  
EDGAR S. BARNEY, Sc. D., 36 Stuyvesant street, New York.  
WILLIAM F. HAVEMEYER, 32 Nassau street, New York.  
PROF. FRANKLIN H. GIDDINGS, LL. D., 150 West 79th street, New York, term of office expiring June, 1907.  
SEYMOUR VAN SANTVOORD, Troy, N. Y., term of office expiring June, 1908.  
FREDERICK W. CAMERON, A. M., Albany, term of office expiring June, 1909.  
THOMAS WEIR, Salt Lake City, Utah, term of office expiring June, 1910.

*Union College***Finance Committee**

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PROF. FRANKLIN H. GIDDINGS, LL. D.

EDWIN W. RICE, JR., PH. D., SC. D.

EDGAR S. BARNEY, SC. D.

**Treasurer**

FRANK BAILEY, A. B.

**Secretary\***

EDWARD P. WHITE, A. M.

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\*Communications or inquiries relating to the requirements for admission or to matters concerning the administration of the college should be addressed to either the President or the Dean.

## ALUMNI ASSOCIATIONS

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### General Alumni Association

*President*, J. Newton Fiero, '67; *Vice-President*, F. P. Bellamy, '68; *Secretary*, Rev. W. N. P. Dailey, '84, Amsterdam; *Treasurer*, Marvin H. Strong, '96, 12 Union St., Schenectady.

### Association of New York

*President*, Frederick W. Seward, LL. D., '49; *Vice-Presidents*, George F. Seward, LL. D., '60, and Charles E. Sprague, PH. D., '60; *Secretary*, Edgar S. Barney, Sc. D., '84, 36 Stuyvesant St., New York City; *Treasurer*, Clarence Johnson, '90, 96 Fifth Ave., New York City.

### Association of Albany and North-Eastern New York

*President*, Hon. John M. Bailey, '61; *Vice-President*, Henry A. Van Alstyne, '93; *Secretary*, Robert M. Eames, '99, 54 Commercial Bank, Albany; *Treasurer*, Walter S. McEwan, '95, 461 Western Ave., Albany.

### Association of Washington, D. C.

*President*, Col. Weston Flint\*, '60; *First Vice-President*, Hon. Joseph E. Ransdell, '82; *Second Vice-President*, Franklin P. Hough, '77; *Secretary*, Norman E. Webster, Jr., '96, 1443 Monroe St., Washington, D. C.; *Treasurer*, Philip J. Ryan, '80, 1411 Massachusetts Ave., Washington, D. C.

---

\*Deceased.

**Association of New England**

*President*, Theodore C. Hurd, '56; *Vice-President*, Rev. Andrew W. Archibald, D. D., '72; *Secretary*, Rev. Daniel D. Addison, D. D., '83, 2 Parkman Terrace, Brookline, Mass.; *Treasurer*, Frederick T. Rogers, M. D., '80, 117 Broad St., Providence, R. I.

**Association of the Genesee Valley**

*President*, Stephen K. Williams, LL. D., '37; *Secretary and Treasurer*, James G. Greene, '84, 52 German Insurance Building, Rochester, N. Y.

**Association of the South**

*President*, Rev. Charles S. Vedder, D. D., LL. D., '51, Charleston, S. C.; *Vice-President*, Archibald W. Ray, '83, Columbia, S. C.; *Secretary-Treasurer*, Prof. Charles J. Colcock, '75, Charleston, S. C.

**Association of the Northwest**

*President and Secretary*, Henry C. Wood, '83, 619 New York Life Building, Chicago, Ill.; *Vice-President*, Eugene K. Herrick, '68.

**Association of Michigan**

*President*, W. A. Waldron, '79; *Vice-President*, Charles D. Lawton, '58; *Secretary*, H. L. Crain, '02, 617 Second Ave., Detroit, Mich.; *Treasurer*, John Ickler, '80, Detroit.

**Association of Western New York**

*President*, Edward P. White, '79; *Vice-President*, Rev. H. R. Fancher, '81; *Treasurer*, Nelson M. Redfield, '87; *Secretary*, Rev. Frederick L. Greene, '99, Buffalo, N. Y.

**Alumni Record**

The College desires to keep as full a record as possible of the residences, occupations and public services of its alumni. It also desires obituary matter. Information should be addressed to Joseph R. Brown, Jr., '03, Chairman of the Alumni Catalogue Committee, Union College Library.

**FACULTY**

---

ANDREW V. V. RAYMOND, D. D., LL. D.  
President

BENJAMIN H. RIPTON, PH. D., LL. D.  
Dean and Professor of History and Sociology

WILLIAM WELLS, PH. D., LL. D.  
Professor Emeritus of Modern Languages and Literature

SIDNEY G. ASHMORE, A. M., L. H. D.  
Professor of the Latin Language and Literature

THOMAS W. WRIGHT, A. M., PH. D.  
Professor Emeritus of Mathematics

FRANK S. HOFFMAN, A. M., PH. D.  
Professor of Mental and Moral Philosophy

OLIN H. LANDRETH, A. M., C. E., Sc. D.  
Professor of Civil Engineering

WENDELL LAMOROUX, A. M.  
Librarian Emeritus

JAMES H. STOLLER, A. M., PH. D.  
Professor of Biology and Geology

EDWARD EVERETT HALE, JR., PH. D.  
Professor of the English Language and Literature

CHARLES P. STEINMETZ, A. M., PH. D.  
Professor of Electrical Engineering



JOHN I. BENNETT, A. B.  
Professor of the Greek Language and Literature

HOWARD OPDYKE, A. B.  
Professor of Physics

EDWARD ELLERY, A. M., PH. D.  
Professor of Chemistry

FRANK COE BARNES, A. M., PH. D.  
Professor of Modern Languages

FRANK B. WILLIAMS, C. E., M. S., PH. D.  
Professor of Engineering Mathematics

HORACE GRANT McKEAN, A. M.  
Professor of Rhetoric and Public Speaking

JOHN LEWIS MARCH, A. M., PH. D.  
Adjunct Professor of Modern Languages

ELMER E. F. CREIGHTON, B. S., E. E.\*  
Assistant Professor of Electrical Engineering

C. F. F. GARIS, PH. B.  
Assistant Professor of Mathematics

JOHN W. HUGHES, B. S. in C. E.  
Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. in E. E.  
Assistant Professor of Electrical Engineering

SAMUEL E. WEBER, B. S. in M. E.  
Instructor in Civil Engineering

---

\*Absent on leave.

WALTER M. CURTIS, S. B.  
Instructor in Mechanical Engineering

DANIEL A. YOUNG, B. S. in C. E.  
Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.  
Instructor in Physical Culture

JAMES H. CUNNINGHAM, B. E.  
Instructor in Electrical Engineering

MORELAND KING, B. E., M. E. E.  
Instructor in Electrical Engineering

CYRUS A. MELICK, C. E.  
Instructor in Civil Engineering

---

Instructor in Modern Languages

ALBERT S. EASTMAN, B. S.  
Assistant in Chemistry

DAVID HUTCHISON, A. M., B. D.  
Assistant in History

ASA DON DICKINSON  
Librarian

HAMILTON W. MABIE, LL. D.  
Lecturer on English Literature

## COLLEGE OFFICERS

---

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Treasurer

175 Remsen St., Brooklyn, N. Y.

CHARLES B. POND

Assistant Treasurer

College Office

FRANK COE BARNES, PH. D.

Secretary of the Faculty

WENDELL LAMOROUX, A. M.

Librarian Emeritus

JAMES H. STOLLER, PH. D.

Curator of the Museum

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Registrar

J. I. McKAIN

Assistant Registrar

ASA DON DICKINSON

Librarian

STEWART A. McCOMBER, M. D.

Director of Gymnasium

GEORGE CLUTE

Superintendent of Grounds and Buildings

## Standing Committees of the Faculty

---

EDUCATION—Professors Ripton, Wells, Ashmore, Wright, Hoffman, Landreth, Stoller, Hale, Steinmetz, Opdyke, Bennett, Barnes, March, Williams, Ellery, McKean and Garis and Dr. McComber.

LIBRARY—Professors Ripton, Landreth and Bennett and Librarian Dickinson.

CATALOGUE—Professors Opdyke, Hale and Barnes.

SCHOLARSHIPS—Professors Ripton, Stoller, Bennett, Ellery and Barnes.

STAGE APPOINTMENTS—Professors Williams, McKean and Garis.

ATHLETICS—Professors Opdyke and Bennett and Dr. McComber.

RULES—Professors Ashmore, Stoller and Hoffman.

ADMISSIONS—Professors Ripton, Ashmore, Landreth, Hale, Opdyke, Bennett, Barnes, March and Garis and Dr. McComber.

ADMISSION TO ADVANCED STANDING—Professors Hale, Landreth and Bennett.

DISCIPLINE—Professors Ripton, Landreth, Hale, Bennett, March and Opdyke.

SCHEDULE—Professors Williams and Garis and Instructor King.

MUSIC—Professors Bennett, March and McKean.

PREPARATORY SCHOOLS—Professors Barnes, Ellery and Garis and Instructors Cunningham and King.

EMPLOYMENT BUREAU—Professors Stoller and Barnes and Dr. McComber.

SENIOR CLASS—Professors March, Williams and Garis.

JUNIOR CLASS—Professors Bennett, Barnes and Hughes.

SOPHOMORE CLASS—Professors Ellery, McKean and Ferguson.

FRESHMAN CLASS—Professors Opdyke, Stoller and Hughes.

## **COURSES OF STUDY**

[For curriculum of the undergraduate courses for the year 1906-1907, see pages 112-116 and pages 180-189.]

### **1.—Courses leading to the degree of A. B.**

COURSE A.—Greek, as indicated on p. 69, is required for admission to this course. Latin and Greek are required for two years, and are elective for the remainder of the course. French and German are included, in addition to the ancient languages.

COURSE B.—This course may be pursued by candidates who satisfy the requirements for admission to the Ph. B. course. Greek is begun on entrance and required for four years. In other respects Course B is virtually identical with Course A.

### **2.—Course leading to the degree of Ph. B.**

This course offers Latin without Greek, for which is substituted additional work in modern languages and science.

### **3.—Course leading to the degree of B. S.**

This course is based upon the study of mathematics and the sciences, with extended work in English and other modern languages.

In courses 1, 2 and 3 the greater part of the work of the last two years is elective.

### **4.—General Engineering course of four years leading to the degree of B. E.**

This course offers the foundation of a broad Engineering Education, comprising Mathematics, the Sciences, the fundamental principles of the special branches of the profession, some training in History and Economics, a knowledge of

both French and German and a course in English. During the third and fourth years two alternative options are offered in this course:

*Option A.*—In which the fundamental principles of advanced technical subjects receive emphasis.

*Option B.*—In which studies are offered which lead to a training for engineering positions of an executive or administrative nature.

#### **5.—General Engineering course of six years leading to the degrees of B. E. and Ph. B.**

This course combines the above four years Engineering courses No. 4, including both its options, with the Latin Scientific course, No. 2. The subjects of the two courses are interwoven throughout each term and the course thus offers in carefully arranged form a combined college and technical training.

#### **6.—Sanitary Engineering course leading to the degree of B. E.**

This differs from course 4 in substituting special work in Sanitary Engineering for some of the General Engineering studies.

#### **7.—Electrical Engineering course leading to the degree of B. E.**

This course is intended to give a broad and thorough Engineering education, with the specific instruction requisite for Electrical Engineering.

**8.—Graduate course in General or in Sanitary Engineering leading to the degree of M. C. E.**

This course of one year's graduate study, consists of lectures, laboratory and research work, and is open to graduates of the General or the Sanitary Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

**9.—Graduate course in Electrical Engineering leading to the degree of M. E. E.**

This course of one year's graduate study consists of lectures, laboratory and research work, and is open to graduates of the Electrical Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

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Students having the profession of Medicine in view are permitted to take the first year studies of the Albany Medical College as a substitute for the studies of the first two terms of the Senior year in Union College. This enables medical students to lessen the time of their academic and professional studies by one year.

For tuition charges, see page 122.



## ADMISSION

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### General Conditions

The regular entrance examinations are held on the Thursday and Friday immediately following Commencement, and on the Monday, Wednesday and Thursday of the first week of the Fall term, as indicated in the calendar.

Candidates are recommended to take, if possible, the uniform entrance examinations offered by the College Entrance Examination Board, which are held annually in many places. Information concerning the time and place for these examinations can be obtained by writing to *College Entrance Examination Board, Post-Office Sub-Station 84, New York, N. Y.*

Candidates must be at least sixteen years old, and, as a preliminary to the entrance examinations, they must present to the President satisfactory testimonials of character, and register (see pages 77, 78) for the necessary examinations.

Candidates from other colleges must bring letters of honorable dismissal, and must pass satisfactory examinations, or present acceptable certificates.

Candidates for a degree must enter before the close of the first Senior term.

All candidates will be examined in the English requirements, and all candidates for admission to the B. S. course or to any one of the B. E. courses will be examined in Plane Trigonometry; but in other subjects Regents' diplomas or certificates from schools approved by the Faculty will be accepted, if they cover the requirements. Regents' pass-cards will be accepted, if they cover all the subjects required in any department. Blank certificates, to be filled out by principals of schools, will be furnished upon application to the Dean.

Students who enter the Freshman class by certificate and fail to maintain their class standing cannot enter the next Freshman class, except by passing the entrance examinations in the departments in which they have failed.

Candidates for any other than the Freshman class are examined also in all studies previously pursued by that class.

## **Requirements for Examination in 1907**

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### **I. A. B. COURSES\***

Course A.—Candidates for admission to the Freshman class in Course A. leading to the degree of A. B. will be examined in subjects Nos. 1, 2, 3, 5, 8, 9 and 10, of the list of subjects specified on pages 70-76.

Course B.—Candidates for admission to the Freshman class in Course B. leading to the degree of A. B. will be examined in subjects Nos. 1, 3, 4, 5, 8, 9 and 10, of the list of subjects specified on pages 70-76.

### **II. PH. B. COURSE**

Candidates for admission to the Freshman class in the course leading to the degree of Ph. B. will be examined in subjects Nos. 1, 3, 4, 5, 8, 9 and 10, of the list of subjects specified on pages 70-76.

### **III. B. S. COURSE**

Candidates for admission to the Freshman class in the course leading to the degree of B. S. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, of the list of subjects specified on pages 70-76.

For admission to this course, Latin (No. 3) may be offered, instead of a modern language (No. 4), if desired.

### **IV., V., VI. and VII. B. E. COURSES**

Candidates for admission to the Freshman class in any one of the four years' courses leading to the degree of B. E. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, of the list of subjects specified on pages 70-76.

Candidates for admission to the Freshman class in the six years' course leading to the degrees of B. E. and Ph. B. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, and also Latin (No. 3), of the list of subjects specified on pages 70-76.

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\*See also page 65.

## LIST OF SUBJECTS

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[Not all of these subjects are required of any one candidate. Those entering any one of the given courses need present for admission only those subjects, from among the following, which are required for admission to that course. These required subjects are enumerated, for each course, on page 69]

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## I.—ENGLISH

All candidates for admission to the Freshman class will be required to pass a written examination in English, and no candidate will be admitted whose work is seriously defective in spelling, punctuation, grammar, or division into paragraphs.

Questions will be set on topics and extracts drawn from the following books. The first list consists of works to be read carefully, with a view to the absorption of the subject matter, *i. e.* as books are generally read. The second list consists of books to be read with critical care, in annotated editions, and with reference to dictionary, grammar and rhetoric. The questions on this set will relate to literary form and logical structure, as well as to substance.

## LIST (1) FOR GENERAL READING.

Shakespeare's "The Merchant of Venice" and "Macbeth"; Addison's "The Sir Roger de Coverley Papers" from "The Spectator"; Irving's "Life of Goldsmith"; Coleridge's "The Rime of the Ancient Mariner"; Scott's "Ivanhoe" and "The Lady of the Lake"; Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur;" Lowell's "The Vision of Sir Launfal"; George Eliot's "Silas Marner."

## LIST (2) FOR MINUTE AND CRITICAL STUDY.

Shakespeare's "Julius Cæsar;" Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso"; Burke's "Speech on Conciliation with America"; Macaulay's Essays on Addison and Johnson.

Attention is called to the fact that while no examination in grammar or rhetoric, as such, will occur, yet a knowledge of the essential principles of grammar and of the elementary principles of rhetoric is involved in the above requirements. An acquaintance with the general outline of the development of English literature will also be required. Newcomer's Introduction to English Literature and Halleck's History of English Literature are recommended.

## 2.—GREEK

- (a) Goodwin's Greek Grammar; Pearson's "Greek Prose Composition," or an equivalent; Xenophon's Anabasis, four books; Homer's Iliad, three books, including Prosody.
- (b) Greek History.
- (c) The Geography of Ancient Greece.

[The attention of instructors is particularly directed to the student's need of a full and accurate knowledge of the Greek and the Latin Grammar.]

## 3.—LATIN

- (a) Latin Grammar and Latin Composition (e. g. Pearson's "Exercises in Latin Composition," or an equivalent); four books of Cæsar's Gallic War, or on equivalent, as Arrowsmith and Whicher's "First Latin Readings" (preferred); six books of Vergil's Æneid; six orations of Cicero; two thousand lines of Ovid, or Sallust's Catiline; the "Roman Method" of pronunciation.

The Grammars of Bennett, Harkness (Complete Edition), Allen and Greenough, West, Lane and Morgan, and Gildersleeve-Lodge are recommended.

- (b) Roman History (e. g., Botsford).
- (c) Geography of Roman Empire.

[A course of four years of preparation in Latin before the student enters college is expected.]

## 4.—MODERN LANGUAGES

Either

*German*.—A knowledge of grammar, comprising declension of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax and word order; a good facility in correct pronunciation and the ability to write from dictation.

Ability to translate at sight a passage of German prose or poetry of ordinary difficulty, and to convert simple English sentences into German. The candidate must have read from 300 to 400 pages of prose and poetry from various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

Or

*French*.—A knowledge of grammar, comprising the forms of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax; the more common idioms; a good facility in correct pronunciation and the ability to write from dictation.

Ability to translate at sight a passage of modern French prose or poetry of ordinary difficulty, and to convert into French simple English sentences founded upon it. The candidate must have read from 300 to 400 pages of prose and poetry from various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

The following outline is suggested as indicating the scope of the above requirements:

In German—

1st year	{	Joynes-Meissner German Grammar, Part I
		Joynes' German Reader, Pages 23-128
		Joynes-Meissner German Grammar, Part III
2d year	{	Three or more works of narrative prose fiction
		and Schiller's Wilhelm Tell

In French—

- |          |  |
|----------|--|
| 1st year | { Whitney's French Grammar, Part I<br>Super's French Reader<br>Whitney's French Grammar, Part II |
| 2d year  | { Three to four works of narrative prose fiction<br>Three to four modern plays                   |

### 5.—MATHEMATICS a

Arithmetic; Algebra, including Quadratic Equations, Proportions, Progressions and Logarithms; Plane Geometry.

In Arithmetic the examination will be on the following subjects: factors and multiples, common and decimal fractions, square root, the more important tables and operations of denominate numbers, percentage and simple interest, compound interest for integral periods only, bank discount, stocks and bonds, and the metric system.

In his preparation in Algebra the candidate should give special attention to factoring, fractional exponents and radicals, and the solution of quadratic equations by factoring and by the formula resulting from the solution of the equation  $ax^2+bx+c=0$ .

### 6. MATHEMATICS b

Solid Geometry and Plane Trigonometry. No certificate covering the requirement in Plane Trigonometry will be accepted. See page 68.

### 7.—PHYSICS

An elementary knowledge of Physics, such as may be gained by a year's course of study covering Mechanics, Sound, Heat, Light and Electricity, as treated in any standard High School text book. Preparation should include individual laboratory work, attested by a notebook, comprising at least thirty-five exercises, chiefly quantitative.



## 8.—HISTORY OF THE UNITED STATES

## 9.—MODERN GEOGRAPHY

## 10.—PHYSIOLOGY

**Requirements for Examination in 1908**

## IN ENGLISH IN ALL COURSES

## LIST (1) FOR GENERAL READING.

Shakespeare's "The Merchant of Venice" and "Macbeth"; Addison's "The Sir Roger de Coverley Papers" from "The Spectator"; Irving's "Life of Goldsmith"; Coleridge's "The Rime of the Ancient Mariner"; Scott's "Ivanhoe" and "The Lady of the Lake"; Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur"; Lowell's "The Vision of Sir Launfal"; George Eliot's "Silas Marner."

## LIST (2) FOR MINUTE AND CRITICAL STUDY.

Shakespeare's "Julius Cæsar"; Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso"; Burke's "Speech on Conciliation with America"; Macaulay's Essays on Addison and Johnson.

All other requirements as in 1907.

**Requirements for Examination in 1909**

## IN ENGLISH IN ALL THE COURSES.

## LIST (1) FOR GENERAL READING.

Ten books are to be selected as follows:—

Group I (two to be selected).

Shakespeare's "As You Like It," "Henry V," "Julius Cæsar," "The Merchant of Venice," "Twelfth Night."



Group II. (one to be selected).

Bacon's "Essays"; Bunyan's "The Pilgrim's Progress," Part I; "The Sir Roger de Coverley Papers" in the *Spectator*; Franklin's "Autobiography."

Group III. (one to be selected).

Chaucer's "Prologue"; Spenser's "Faerie Queene," (selections); Pope's "The Rape of the Lock"; Goldsmith's "The Deserted Village"; Palgrave's "Golden Treasury" (First Series) "Books II. and III.," with especial attention to Dryden, Collins, Gray, Cowper and Burns.

Group IV. (two to be selected).

Goldsmith's "The Vicar of Wakefield"; Scott's "Ivanhoe"; Scott's "Quentin Durward"; Hawthorne's "The House of the Seven Gables"; Thackeray's "Henry Esmond"; Mrs. Gaskell's "Cranford"; Dickens' "A Tale of Two Cities"; George Eliot's "Silas Marner"; Blackmore's "Lorna Doone."

Group V. (two to be selected).

Irving's "Sketch Book"; Lamb's "Essays of Elia"; De Quincey's "Joan of Arc" and "The English Mail Coach"; Carlyle's "Heroes and Hero Worship"; Emerson's "Essays" (Selected); Ruskin's "Sesame and Lilies."

Group VI. (two to be selected).

Coleridge's "The Ancient Mariner"; Scott's "The Lady of the Lake"; Byron's "Mazeppa" and "The Prisoner of Chillon"; Palgrave's "Golden Treasury" (First Series) "Book IV," with especial attention to Wordsworth, Keats and Shelley; Macaulay's "Lays of Ancient Rome"; Poe's "Poems"; Lowell's "The Vision of Sir Launfal"; Arnold's "Sohrab and Rustum"; Longfellow's "The

Courtship of Miles Standish"; Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur"; Browning's "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Evelyn Hope," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "The Boy and the Angel," "One Word More," "Hervé Riel," "Pheidippides."

LIST (2) FOR MINUTE AND CRITICAL STUDY.

Shakespeare's "Macbeth"; Milton's "Lycidas," "Comus," "L'Allegro," and "Il Penseroso"; Burke's "Speech on Conciliation with America," or Washington's "Farewell Address" and Webster's "First Bunker Hill Oration"; Macaulay's "Life of Johnson," or Carlyle's "Essay on Burns."

All other requirements as 1907.

## ENTRANCE EXAMINATIONS

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1907

Entrance examinations will be held at the college in **June** and in **September**, in accordance with the schedule given below.

*Only those who register at the appointed time will be admitted to the examinations of the following days.*

## SCHEDULE OF THE JUNE EXAMINATIONS

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Thursday, June 13.

9 A. M. *Candidates will present their credentials at the office of the President and register for examination.*

11 A. M. Algebra  
Physiology.

2 P. M. U. S. History.  
Physics.

4 P. M. English.

Friday, June 14.

9 A. M. Latin.      11 A. M. German.      2 P. M. Greek.

Solid Geometry.      French.

Plane Geometry.  
Plane Trigonometry.

SCHEDULE OF THE SEPTEMBER EXAMINATIONS

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Monday, September 16.

2 P. M. *Candidates will present their credentials at the office of the President and register for examination.*

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Wednesday, September 18.

9 A. M. Physics.	11 A. M. Algebra.	2 P. M. U. S. History.
Physiology.		3 P. M. English.

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Thursday, September 19.

9 A. M. Latin.	11 A. M. German.	2 P. M. Greek.
Solid Geometry.	French.	Plane Geometry.
		Plane Trigonometry.

## DEPARTMENTS OF INSTRUCTION

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### The Greek Language and Literature

PROFESSOR BENNETT

In Course A, leading to the degree of Bachelor of Arts, Greek is required during the Freshman and Sophomore years, and may be elected during the Junior and Senior years; in Course B, leading to the degree of Bachelor of Arts, Greek is begun on entrance and required for four years.

1. **The New Testament.**

Required of Freshmen in A. B. Course A. Four hours weekly throughout the year.

2. **The Elements of Greek.**

Required of Freshmen in A. B. Course B. Four hours weekly throughout the year.

3. **Xenophon: The Memorabilia.—Plato: The Apology, the Crito and parts of the Phaedo.—Aristophanes: The Clouds.**

Required of Sophomores in A. B. Course A. Three hours weekly throughout the year.

4. **Xenophon: The Anabasis.**

Required of Sophomores in A. B. Course B. Three hours weekly throughout the year.

5. **Plato: The Apology, the Crito and parts of the Phaedo.—Homer: Introductory course.**

Required of Juniors in A. B. Course B. Two hours weekly throughout the year.

6. **Homer, or The Greek Drama.**

Required of Seniors in A. B. Course B, and elective for Juniors and Seniors in A. B. Course A. Two hours weekly throughout the year.

7. **Honors:** Candidates for honors in Greek, either in A. B. Course A or in A. B. Course B, will be required to take all the work in Greek offered in their respective courses, to maintain a general average of ninety per cent. in that work, to meet for two additional hours a week during the first two terms of the Senior year for the study of a Greek text, and to write theses on assigned subjects.

## **The Latin Language and Literature**

PROFESSOR ASHMORE

The studies of this department are obligatory on all students of the Freshman and Sophomore classes, who are candidates for either of the degrees, A. B. and Ph. B. In the Junior and Senior years Latin is elective.

### **Freshman Latin**

**First Term.** Livy: Selections from Books I, XXI, XXII. Latin Composition.

Required in the A. B. and Ph. B. Courses. Four hours weekly during the term.

**Second Term.** Tacitus: Minor Works. Latin composition.

Required in the A. B. and Ph. B. Courses. Four hours weekly during the term.

**Third Term.** Cicero: Some minor work; Roman history (Botsford); Latin Composition.

Required in the A. B. and Ph. B. Courses. Four hours during the term.

### **Sophomore Latin**

**First Term.** Horace: Odes and Epodes.

Required in the A. B. and Ph. B. Courses. Three hours weekly during the term.

**Second Term.** Terence: Phormio and Adelphoe; Lectures on Ancient Comedy.

Required in the A. B. and Ph. B. Courses. Three hours weekly during the term.

**Third Term.** Plautus: Captivi and Trinummus.

Required in the A. B. and Ph. B. Courses. Three hours weekly during the term.

### **Junior Latin**

**First Term.** Satires of Juvenal and Horace; History of Roman Literature.

Elective for Juniors in the A. B. and Ph. B. Courses. Two hours weekly during the term.

**Second Term.** Lectures on the topography of ancient Rome, with a study of Platner's "Ancient Rome."

Elective for Juniors in the A. B. and Ph. B. Courses. Two hours weekly during the term.

**Third Term.** Selected Letters of Pliny and Cicero; Private Antiquities of the Romans.

Elective for Juniors in the A. B. and Ph. B. Courses. Two hours weekly during the term.

### **Senior Latin**

**First Term.** Cicero: De Officiis, or Tusculan Disputations.

Elective for Seniors in the A. B. and Ph. B. Courses.

Two hours weekly during the term.

**Second Term.** Lucretius: Lectures on the Atomic Theory and the Philosophy of Epicurus.

Elective for Seniors in the A. B. and Ph. B. Courses. Two hours weekly during the term.



**Third Term.** Early Latin; Inscriptions; or some subject especially suited to students intending to become teachers.

Elective for Seniors in the A. B. and Ph. B. Courses.  
Two hours weekly during the term.

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Parallel reading will be recommended according to the character of the authors and subjects named in the programme. Equivalents may be substituted in the programme at any time, at the discretion of the head of the department.

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**Special Honors.** Candidates for Special Honors in Latin are required to take all the courses of the four years; to do additional private reading, as indicated by the department, and to prepare a thesis.

### Modern Languages

PROFESSOR BARNES, ADJUNCT PROFESSOR MARCH  
AND INSTRUCTOR ———.

#### German

PROFESSOR BARNES AND ADJUNCT PROFESSOR MARCH

The courses aim to give a ready reading knowledge of German and a general acquaintance with its literature. While the literary side of the work receives chief attention after the first year, the practical is also kept in view and the study of grammatical topics and colloquial German, together with practice in writing, forms a part of every course. German is made the language of the class room whenever practicable and in some sections is used exclusively.

1. **Elementary.** Grammar study: with exercises and supplementary composition, reading and memorizing, use of German in class.

Readings—Harris's German Reader and selections on popular scientific subjects.

Required in the A. B. (B), Ph. B., B. S. and B. E. courses of Freshmen who offer French at entrance; also in the B. E. course, and, as an alternate with French, in the B. S. course, of those who offer Latin. Three hours weekly throughout the year.

- 1a. **Elementary.** Joynes-Meissner German Grammar, Parts I and III, with exercises; Brandt's German Reader.

Readings—Schiller: Wilhelm Tell; Goethe: Hermann und Dorothea.

Required of Sophomores in the A. B. course and of Freshmen as in 1 who have had one year of German in school. Three hours weekly throughout the year.

2. **Intermediate.** Thomas's Practical German Grammar for review and reference; connected composition; use of German in class.

Readings—The time in class is devoted to the reading and discussion of selected works from the German classics and from recent drama and fiction; matter is also assigned for outside reading with reports and examination on the work done. The work varies somewhat from year to year, but aims to give every class an acquaintance with some of the masterpieces of German literature and some knowledge of present day German life and institutions.

Required in the Ph. B., B. S. and B. E. courses of Freshmen who offer German at entrance; in the A. B., Ph. B. and B. S. courses of Sophomores who have had German 1; in the B. E. course of Sophomores who passed French at entrance; and, as an alternate with 1a, in the A. B. course of Sophomores who have had two years of German before entrance. Elective in the A. B. course of Juniors who have had 1a. Three hours weekly throughout the year in the Ph. B. and B. S. (or A. B.) courses and during terms 1 and 2 in the B. E. course.

- 2a. **Intermediate.** This is a course in the reading of scientific German. A reader consisting of selections on scientific subjects forms the basis of the work and is supplemented by one or more monographs on technical subjects within the grasp of the class at this stage of its work.

Required during the third term, of B. E. members of German 2. Three hours weekly through the term.

3. **Advanced.** Nineteenth century drama, development and leading representatives. Readings from Von Kleist and Grillparzer. *Das junge Deutschland*; assigned study. Readings from Hebbel, Ludwig and Von Wildenbruch. *Die freie Bühne*; assigned study. Nineteenth century fiction. Readings from Sudermann, Hauptmann, Meyer, Scheffel and others.

Elective for Juniors in the Ph. B. and B. S. courses who have done 2 and to Juniors in the A. B. course who have done 1a with a grade of 90. Required, as an alternative with French, of Juniors in the B. S. course who offered Latin at entrance, and of Sophomores in the Ph. B. and B. S. courses who in Freshman year were admitted to both German 2 and French 2. Three hours weekly throughout the year.

- 3a. **Advanced.** Goethe and the classical period, readings and assigned studies. Lessing: *Nathan der Weise*, *Emilia Galotti*; Schiller: *Wallenstein*, *Maria Stuart*, *Jungfrau von Orleans*. Outline study of the lives of these writers. Koch: *Geschichte der deutschen Literatur* as a handbook, with references to other works.

This course alternates with course 3 and is given under the same conditions.

- 3b. **Special.** This course is given in three sections: (a) A course in composition and conversation, based on Stern's *Geschichten von deutschen Städten* or a similar work; (b) A course in commercial German, consisting of reading, correspondence and newspaper work; (c) A course

in the reading of historical and political matter, with composition based on the articles read.

This course may be substituted for course 3a, and is given under the same conditions.

4. **Advanced.** Goethe: (1) A study of Goethe's life and works with readings from his autobiography (*Von Jagemann's Dichtung und Wahrheit*) and epic writings (*Bernhardt's Meisterwerke*); *Egmont*, *Iphigenie auf Tauris*, *Torquato Tasso*. (2) *Faust*: *Thomas's Faust*, Part I., reading and interpretation; the *Faust* legend in literature.

Elective for Seniors in the A. B., Ph. B. and B. S. courses who have had necessary previous training. This course will ordinarily follow course 3. Two hours weekly throughout the year.

- 4a. **Advanced.** History of German literature: *Bernhardt's Deutsche Literaturgeschichte* in class with *Vilmar's Geschichte der deutschen Nationalliteratur* for reference, accompanied by *Musterbuch* and special readings. Two hours weekly, first half year.

A course in Middle High German: Grammar and reading, supplemented by an outline study of the history of the language. Two hours weekly, second half year.

This course alternates with course 4 and is given under the same conditions. It is expected that those electing it will have had course 3a. It is intended primarily for students who are preparing to teach German.

- 4b. **Special.** This course consists in the reading of one or more historical monographs and, when time allows, a historical novel, with parallel readings; followed by a careful study of a number of political speeches and parliamentary addresses, with discussion of the topics involved; supplemented by the reading of newspaper reports and editorial articles. The work aims to lay the foundation for future study along these lines and to give some insight into present governmental and social conditions in Germany.

This course may be substituted for course 4a, and is given under the same conditions.

- 4c. **Honor Course.** Special courses, open only to members in good standing in Senior Elective German, are offered to candidates for honors in this department.
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### French

ADJUNCT PROFESSOR MARCH AND INSTRUCTOR ———.

A reliable practical knowledge of French is the first result aimed at in all the classes, but as soon as possible the literary side of the language is brought to the front, and good books are read for what they contain. The more advanced courses vary somewhat from year to year, according to the judgment and preference of the instructors, and the ability and character of the students composing the classes.

1. **Elementary French.** Whitney's French Grammar; Super's French Reader; Souvestre's *L'Abbé Constantin*. Constant drill in grammatical forms, common idioms, pronunciation and writing to dictation.

Required of Freshmen in the A. B. course (A); of Freshmen who offer German in the A. B. (B), Ph. B., B. S., and B. E. courses; and, as an alternative with German, in the B. S. course of those who offer Latin. Three hours weekly throughout the year.

- 1a. **Intermediate French.** Whitney's French Grammar: composition, writing to dictation, and memorizing. Masson's *La Lyre Française*.

In addition to daily translation in class, easy reading is assigned to be done outside and reported upon. Since this course is for most students the last required French in college, it is devoted to selected works of various periods. The number and character of the books read may vary considerably from class to class.



Required of Freshmen of the Ph. B. and B. S. courses who offer French at entrance; in the B. E. course of those who do not pass French at entrance; and, as an alternative with French 1, in the A. B. course of those who have had two years of French before entrance. Three hours weekly throughout the year.

2. **Intermediate French.** This course is similar to course 1a.

Required of Sophomores in the A. B., Ph. B. and B. S. courses who have had French 1. Three hours weekly throughout the year.

3. **Advanced French.** French literature of the 19th Century. Discussion of various authors and of some phases of modern French life and character; assigned reading; careful translation in class. With suitable classes, attention is paid to French etymologies, and the laws of the evolution of the language.

Elective for Juniors of the A. B., Ph. B. and B. S. courses. Required, as an alternative with German, of Juniors in the B. S. course who offered Latin at entrance and of Sophomores in the Ph. B. & B. S. courses who in Freshman year were admitted to both German 2 and French 1a. Three hours weekly throughout the year.

4. **Advanced French.** French literature of the 17th Century.

Selected works of Corneille, Racine Molière, and La Fontaine, are read carefully in class. Assigned readings, discussions of men, of their work and of the period. Lanson's *Littérature Française*. Taine's *L'Ancien Régime*.

This course may in any year be a continuation of Course 3.

Elective for Seniors of the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

**Honor Course.** Three advanced courses, leading to special honors in French, are offered to those students who are qualified to pursue them.

**Spanish**

PROFESSOR BARNES AND INSTRUCTOR ———.

This course aims to ground the student in the grammar of modern Spanish and to give a good reading knowledge of the language. Practice in writing is continued throughout the course.

1. **Junior Elective.** Hills and Ford's Spanish Grammar, with exercises. Ramsey's Reader, practice and sight translation.

Readings—Selections from Gil Blas, a recent novel and a modern play.

Open to Juniors in the A. B., Ph. B. and B. S. courses and to Seniors who have not had Spanish in Junior year. Three hours weekly throughout the year.

2. **Senior Elective.** Grammar and composition, commercial correspondence and newspaper reading.

Readings—In connection with a brief survey of the development of Spanish literature, one or two dramas of the classical period and one or two modern plays are read, together with some works of recent fiction. The amount read depends upon the nature of the works selected and the ability of the students composing the class.

Open to Seniors who have had Spanish I. Two hours weekly throughout the year.

**English Language and Literature**

PROFESSOR HALE

1. **Old English.** This course gives an introduction to the language in Cook's First Book in Old English, with especial attention to the phonology and the relations of Old and Modern English with the other Teutonic languages. In the third term the work is carried on either by a study of Old English poetry in "Beowulf" or by



further reading in West Saxon prose, especially the Chronicle.

Elective for Juniors in all courses. Two hours weekly throughout the year.

2. **History of the English Literature.** This study is pursued with a text-book for the purpose of giving a foundation knowledge of the facts of English Literature.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Two hours weekly during the fall and winter terms.

3. **Shakespeare.** A careful reading of "Hamlet," with particular attention to the language, action and characters, and a summary of questions of text, date, and sources. A view is also given of the conditions of the Elizabethan theatre, and the general standpoint taken is that of the acted drama.

Required of Sophomores in the B. E. course during the fall term, and of Sophomores in the A. B., Ph. B. and B. S. courses during the spring term. Three and two hours respectively.

4. **Shakespeare.** A reading of a number of plays chosen to represent the different periods of Shakespeare's life and the different forms of the Shakespearean drama. Six plays will be read each year, a different set being chosen every other year.

Elective for Seniors and Juniors in all courses. One hour weekly throughout the year.

5. **Modern Poetry.** The study of some great poem of the nineteenth century: in 1905-6 Tennyson's "Idylls of the King" was the subject.

Required of Sophomores in the B. E. course in the winter term. Two hours weekly throughout the year.

6. **English Prose.** The course considers especially the novel, the essay, and the oration. In each case especial attention is given to the general character of the literary form in question and the specific character of the different authors that can be treated. In the first term Perry's "Study of Prose Fiction" is used: in the later terms the work is carried on without a text-book.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

7. **English Poetry of the Nineteenth Century.** An introduction to the critical study of poetry. Page's "British Poets of the Nineteenth Century" furnishes a collection of texts in which the work may readily be followed. The main plan is to form habits of discrimination, and a poetic taste by distinguishing between the characteristics of the different poets read.

Elective for Seniors in all courses. Two hours weekly throughout the year.

## **Rhetoric and Public Speaking**

PROFESSOR MCKEAN

1. **Freshman Rhetoric.** The work is pursued with study of a text-book, Adams Sherman Hill's Principles of Rhetoric being now used.

Required of Freshmen in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

- 1a. **Freshman Rhetoric.** The work is pursued by text-book, as in course 1. The instruction, however, is somewhat more technical and scientific in general character than that of course 1.

Required of Freshmen in the B. E. course. Two hours weekly throughout the year.

2. **Sophomore Rhetoric.** The work consists in the writing of orations with criticism and a delivery of them, either in special appointments or before the class, and the writing and criticism of essays.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. One hour weekly throughout the year.

Required of Sophomores in the B. E. course. One hour weekly throughout the year.

3. **Junior Rhetoric.** The work is like that of course 2, but of a more advanced character.

Required of all Juniors. One hour weekly throughout the year.

4. **Argumentation and Debate.** The work follows Alden's Art of Debate, but gives a good deal of practice in preparation of briefs and arguments and in oral debates.

Elective for Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

5. **Senior Rhetoric.** The work is like that of course 2, but of a more advanced character.

Required of all Seniors in the A. B., Ph. B. and B. S. courses. One hour weekly throughout the year.

- 5a. **Senior Rhetoric..** One literary essay each term.

Required of Seniors in the B. E. course during the fall and winter terms.

## **History and Sociology**

PROFESSOR RIPTON AND MR. HUTCHINSON

The work of the department covers three years, beginning with the first term of the Sophomore year. The instruction is given by text-book, by lectures, and by library references.

1. **English History.** The narrative history of England is made the basis of study, but especial attention is given to the industrial, commercial and social history of the country, and to the development of the English Constitution. The importance of collateral readings from the English authorities is emphasized.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, first and second terms.

2. **French History.** Beginning with a brief study of Roman Gaul, the main purpose is to show the growth of the French nation and the working of the different forces which promoted or retarded the unity of the state. The period studied concludes with the year 1789. The history of France from that date to the present is taken up in greater detail in Course 4.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, third term.

3. **American History.** A study is made of the period of American discovery and exploration and of the colonial period. The main part of the work, however, begins with an examination of the causes of the American Revolution. The course is guided by text-books and lectures, and much work is done in the library among the sources and authorities.

Elective for Juniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

4. **French Revolution and Nineteenth Century.** This course considers the causes, ideas and progress of the French Revolution and the reconstruction of European politics and society produced by the revolutionary and Napoleonic wars. It then takes up an examination of the events and forces which contributed to the unification of Italy and of Germany, and concludes with a brief study of the Eastern Question. The course is designed to give a clear

understanding of political affairs as they exist in Europe to-day and the historical processes by which they were brought about.

Elective for Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

5. **Comparative Politics.** A comparative study is made of the constitutions and governments of England, the United States, and the principal nations of Continental Europe. Sufficient attention is given to historical origins to account for characteristic differences, but the work consists mainly of a systematic study of the constitutions, their adoption and methods of amendment, the distribution of governmental powers, and their practical operation, including some account of political parties.

Elective for Seniors. Two hours weekly throughout the year.

6. **Economics.** It is the design of this course to give instruction in the leading principles of Economics. While a text-book is used in order to secure more rapid progress, still the views of no school are taught exclusively. By lectures and required collateral reading an attempt is made to present the results of the latest and most approved investigations in the science. The course closes with a series of lectures upon the history of Political Economy.

Required of Seniors in all courses. Three hours weekly, first term.

7. **Sociology.** In this course the mutual relations of men in society are examined historically, that the student may learn how present conditions have resulted from past experience. Present social forces and needs are considered, with the purpose of training the students to fulfill the demands of good citizenship. The collateral reading and

practical sociological investigation is guided throughout the course by lectures.

Required of Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

## **Mental and Moral Philosophy**

PROFESSOR HOFFMAN

The courses in this department begin with the first term of the Junior year and extend through the entire Senior year. Logic, Elementary Psychology and Elementary Ethics come in the Junior year and are required. All the other courses are taken up in the Senior year and are elective. Instruction in the various studies of the department is usually given by means of lectures, discussions, and the use of a text-book.

1. **Logic.** This study, inasmuch as it is required, is confined to the simple elements of the science. As soon as the rules of correct thinking are mastered, the student is put at once to the analysis of arguments, the chief purpose of the study being to develop skill in detecting fallacies. Extracts from many authors are brought before the class for criticism, and so far as possible they are taken from every field of thought.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during the first term.

2. **Elementary Psychology.** This course is designed to acquaint the student with the most obvious facts of his mental experience; and the attempt is made to classify these facts into a system. The relation of Psychology to the other sciences is set forth, and the importance of the study is emphasized in that it lays the foundation for all the sciences of man as a political, moral and religious being.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during the second term.



3. **Elementary Ethics.** Only the outlines of the subject are presented in this course. The ordinary duties of man are pointed out by first describing those concerning himself and those that arise from his relation to others, to nature, and to God.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

4. **Advanced Psychology.** The chief problems discussed in this course are the recent views concerning the nature of perception, the localization of functions and the theories concerning memory, conception, the emotions and the will. The facts of abnormal Psychology are also here considered, especially insanity, dreams, hypnotism, telepathy, and the hypothesis of a secondary self.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during first term.

5. **Advanced Ethics.** Some account of the history of Ethics is given in this course, and present ethical theories are stated and discussed. The relation of Ethics to other sciences is emphasized and much attention is given to the ethical problems involved in such questions as education, taxation, transportation, corporations, the treatment of criminals, the care of the poor, and the formation and dissolution of the family.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during second term.

6. **Evolution of Religion.** The object of this course is to show how religion originates and to trace out the steps taken in its development. The chief ideas of the leading religions of the heathen world are critically examined, their excellencies and defects are pointed out, and a comparison of them is made with the special doctrines of the Christian system.



Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

7. **History of Philosophy.** The attempt is made in this course to go over with considerable detail the general field of Philosophy from the earliest times down to the present day. In this way the views of the principal thinkers of the world are presented and discussed upon a great variety of problems, such as the validity of knowledge, the nature of virtue, the foundations of the State and the existence of God. Much is made in this course of the historical connection of the different systems for the purpose of impressing upon the mind of the student the successive steps that have been taken in the actual development of thought.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

## **Engineering Mathematics**

PROFESSOR WILLIAMS, INSTRUCTOR MELICK AND INSTRUCTOR YOUNG

Instruction in mathematics to all engineering students is now given in the General Engineering Department, and the description of this work will be found on page 152.

Mathematics is required of Freshmen and Sophomores in the B. E. course. Elective work is offered in the third term Senior year of the Sanitary Engineering course.

In the B. E. course especial effort is made to incite the student to independent thinking, and to enable him to apply his knowledge of mathematics to his technical work, at the same time holding him to rigorous methods and logical conclusions.

A number of thread models, as well as models in wood and plaster, are available for class-room work, to illustrate the conic sections and to give the student a clear idea of surfaces and their intersections in three-fold space.

The following courses are given:

1. **Algebra, including elements of determinants.** Downey's Algebra.

Required of Freshmen in the B. E. course. Four hours weekly during first term.

2. **Trigonometry.** Murray's Trigonometry.

Required of Freshmen in addition to the trigonometry required at entrance in the B. E. course. One hour weekly during third term.

3. **Analytic Geometry.** Tanner and Allen's Analytic Geometry.

Required of Freshmen in the B. E. course. Four hours weekly during second term, and two hours weekly during third term.

4. **Calculus.** Murray's Infinitesimal Calculus.

Required in B. E. course. Three hours weekly during third term of Freshmen year, three hours weekly during first and second terms, and two hours weekly during third term of Sophomore year.

5. **Least Squares.** Merriman's Least Squares.

Required of Seniors in General Engineering Course, Option A. Three hours weekly during the second term.

## **Academic Mathematics**

ASSISTANT PROFESSOR GARIS

Mathematics is required in the A. B., Ph. B. and B. S. courses during the Freshman year and is elective during the Sophomore, Junior and Senior years. The object of the instruction in these courses is to train the student to clear and exact thinking and to provide him with a knowledge of

mathematics broad enough to enable him to give instruction in preparatory schools or to pursue his studies further to good advantage.

The following courses are given:

1. **Solid Geometry.** Wentworth's Geometry.

Required of Freshmen in the A. B. and Ph. B. courses. Four hours weekly during the first term.

2. **Higher Algebra.** Downey's Algebra.

Required of Freshmen in the B. S. course during the first term, and of Freshmen in the A. B. and Ph. B. courses during the second term. Four hours weekly.

2a. **Algebraic Analysis.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses. Two hours weekly during the third term.

3. **Trigonometry.** Murray's Plane Trigonometry.

Required of Freshmen in the A. B. and Ph. B. courses. Three hours weekly during the third term.

4. **Plane Analytical Geometry.** Tanner and Allen's Analytic Geometry.

Required of Freshmen in the B. S. course. Three hours weekly during the second and third terms.

4a. **Plane Analytic Geometry.** Tanner and Allen's Analytic Geometry.

Elective for Sophomores in the A. B. and Ph. B. courses. Two hours weekly throughout the year.

4b. **Solid Analytic Geometry and Determinants.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 4 or 4a. Two hours weekly during the first term.

**4c. Higher Plane Curves.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 4b. Two hours weekly during the second term.

**5. Calculus. Murray's Infinitesimal Calculus.**

Elective for Sophomores in the B. S. course and for Juniors in the A. B. and Ph. B. courses who have had 4a. Two hours weekly throughout the year.

**5a. Advanced Calculus.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5. Two hours weekly during the first term.

**6. Differential Equations. Murray's Differential Equations**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5a. Two hours weekly during the second term.

**7. Theory of Function of Real Variables.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5a. Two hours weekly during the second term.

**7a. Theory of Functions of a Complex Variable.**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 7. Two hours weekly during third term.

**8. Special Honors in Mathematics.**

Candidates will be given advanced work in various subjects suited to their special ability. Open to Seniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

## Mechanics and Physics

PROFESSOR OPDYKE

The required work in Physics extends through the three terms of the Sophomore year. This is followed by electives in laboratory work and in Mathematical Physics. The collection of apparatus for the illustration of lectures is extensive, and has been secured largely from foreign makers, including sets of standard pattern by Koenig, Duboscq, Ruhmkorff and others.

The courses in more detail are these:

1. **General Physics.** This course is intended to give a general presentation of the facts and laws of Physics. No knowledge of mathematics is assumed beyond an acquaintance with Algebra and Plane Trigonometry. Experimental lectures, recitations and discussions aim to make the student familiar with the chief phenomena of Physics and their explanation.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

- 1a. **Elective in Laboratory Work.** This course is open to those who have taken 1, and consists of individual work by the students themselves in the laboratory. The experiments performed are such as allow accurate measurement of the quantities involved; and the results obtained are used to verify some general law, or to obtain some physical constant of nature.

Elective for Juniors and Seniors in the A. B., Ph. B. and B. S. courses. Two periods of two hours each weekly throughout the year.

2. **General Physics for Engineers.** This course treats the subject more mathematically than 1, and is given to students in the Engineering course. The Calculus is used, more especially during the second and third terms. Assuming some knowledge of the fundamental facts of

Physics, attention is paid to the discussion of the phenomena and their mathematical analysis, in so far as this is possible with the use of the more elementary analytical methods. The work consists of lectures, recitations and laboratory practice.

Required of Sophomores in the B. E. course. Two, three and three classroom hours a week throughout the first, second and third terms, respectively; and one laboratory period a week throughout the year.

- 2a. **Elective in Mathematical Physics.** This course is open to those who have taken 2, and aims to carry out and complete the mathematical discussion of some parts of the subject. A good knowledge of Calculus is required, and an elementary knowledge of Differential Equations. Some time is devoted to a further study of Differential Equations as applied to physical problems, and through lectures and assignments of reading the student is introduced to more advanced work.

Elective for Juniors and Seniors who have taken 2. Two hours a week throughout the year.

3. **Astronomy.** A short course in Astronomy is also given. This course is general and descriptive in character, including some reference to the more elementary mechanical aspects of the subject.

Required of Juniors in the A. B. and B. S. courses, and open as an elective to the Juniors in the Ph. B. course. Three hours a week throughout the second term.

4. **Spherical Trigonometry and Astronomy.** This course differs from the preceding in that it begins with the study of Spherical Trigonometry as applied to some of the problems of practical Astronomy. The course is less descriptive and more mathematical than 3.

Required of Juniors in the General Engineering course, Option A, and in the Sanitary Engineering course. Three hours a week throughout the third term.



## Chemistry

PROFESSOR ELLERY AND MR. EASTMAN

The object of the instruction in this department is to develop power of accurate observation, of logical reasoning, and of forming correct judgments on observed facts. Students who are planning special courses in Chemistry, Medicine, Biology, Geology, or other branches of natural science, will find the courses of great value.

1. **General Chemistry.** The course includes an exhaustive study of the non-metals and their compounds, together with the fundamental laws and theories of Chemistry, a special study of the common metals, and an introduction to Organic Chemistry. The work is distributed through the year as follows:

Fall term: Theories and general principles; study of the occurrence, preparation and properties of the non-metals.

Two lectures and one laboratory period each week.

Winter term: Study of the occurrence, metallurgy and properties of the common metals, and reactions for the metals in solution.

Two lectures and one laboratory period each week.

Spring term: Study of reactions of acid radicals in solution. Elementary blowpipe analysis.

One lecture and four laboratory periods each week.

Required of Sophomores in the B. E. course.

- 1a. **General Chemistry.** This course is similar to course 1, in that it includes the study of metals and non-metals, theories and principles, but no analytical work is done.

Required of Freshmen in the B. S. course, and of Sophomores in the Ph. B. course. Elective for Juniors and Seniors in the A. B. course. Two lectures and one laboratory period a week throughout the year.



2. **Qualitative Analysis.** This course comprises a systematic examination of metals and acid radicals in solution, and a systematic examination of complex solids.

Required of Juniors in the B. E. course. Three laboratory periods a week during the fall term.

- 2a. **Qualitative Analysis.** A study of the reactions of bases and acids in solution, a complete course in blowpipe analysis, a systematic examination of solutions of metals and acids, and of complex solids. The aim of the year's work is to enable the student to make a complete qualitative analysis of complex inorganic substances.

Elective for Juniors and Seniors in the Ph. B. course, for Sophomores in the B. S. course, and for Seniors in the A. B. course who have had course 1a. Three laboratory periods a week throughout the year.

3. **Quantitative Analysis.** This is a course in which the student becomes familiar with the various gravimetric and volumetric methods of analysis.

Elective for Juniors in the B. S. course, and for Seniors in the Ph. B. course, who have had course 2a. Three hours a week throughout the year.

4. **Organic Chemistry.** This course comprises analysis of organic compounds, the preparation of typical organic substances, and a thorough study of the principles and theories of organic chemistry.

Elective for Seniors in the B. S. course, who have had course 3. Three hours a week throughout the year.

5. **Special Analyses.** This course includes Quantitative Analysis, both gravimetric and volumetric determinations of common elements, a thorough course in Water Analysis, comprising a study of proper sanitary conditions, as well as complete chemical analysis of various samples of

water, collected by the student, and a short course in milk analysis.

Required of Seniors in the Sanitary Engineering course. Two hours a week during the fall and winter terms.

6. **Chemical Technology.** This course consists of a series of lectures on the more important industries which make practical use of Chemical Principles, and includes a discussion of the essential Chemical Processes employed. Fuels, sewage, factory waste, the manufacture of sulphuric acid, soda, glass, salt, paper, etc., are some of the topics presented.

Elective for Seniors. Two hours a week during the Spring term.

## **Biology and Geology**

PROFESSOR STOLLER

In the study of these sciences the objects sought to be accomplished may be summarily stated as follows: 1. To broaden the student's knowledge of the world of external nature by acquainting him with the salient facts and principles of the sciences which treat of animals and plants and of the earth. 2. To train the student in the methods of scientific study, so that he learns to acquire knowledge at first hand, that is, to observe, compare and interpret the facts and phenomena of nature and to depend upon his own powers of acquisition and understanding, rather than upon books or ready-to-hand sources of information. 3. To acquaint the student with the bearings of these sciences upon matters of practical importance, as the relation of the life processes of certain groups of organisms to human diseases, and the applications in sanitary science and therapeutics of our knowledge of these matters; the anatomy and physiology of animals, especially the vertebrates, as a foundation for human anatomy and physiology; the food and nutrition of

plants with reference to agriculture; the growth of trees and the tissue structure of woods with reference to forestry and the uses and values of timbers; the occurrences and economic values of many of the materials considered in geologic science, as building stones, mineral ores, fuels, etc., etc. 4. To afford the student a grasp of the great inductions of biologic and geologic science in their general philosophical values; the history of the earth and its organisms; the idea of evolution and the scientific evidences of a process of organic evolution; the theories of various authors as to the causal factors of the process; and, finally, the meaning of nature as an expression of creative energy.

1. **General Biology.** This course is intended to give the student a knowledge of living plants and animals, to afford mental training in the study of nature, and to give the student a grasp of the broader facts and principles of biological science in their general philosophical values. Recitations and laboratory work.

Required of Sophomores in the B. S. course, three hours weekly throughout the year, and of Juniors in the Ph. B. course during the first two terms.

2. **Animal Morphology.** This course is adapted for students who wish a somewhat advanced knowledge and training in biology, especially as a preparation for teaching or for the medical profession. The work is mainly in the line of comparative anatomy, and includes the dissection of several vertebrate types in detail. Some time is given to elementary histology and embryology, involving the technique of section-cutting, etc. The course includes the reading of texts in general zoology and embryology.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours (six hours of laboratory work) weekly throughout the year.

3. **Bacteriology.** Students who have elected course 2 may be permitted to take, in the third term, elementary prac-

tical bacteriology as an extra or in place of a part of the anatomical work.

4. **General Principles of Zoology.** The aim of this course is to use the data of zoology for their worth as contributing to liberal culture. The more general facts and principles of animal structure, function and development are reviewed and considered in their relation to the study of man. The scientific evidences of organic evolution and the theories of evolution of various authors are considered. Lectures.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

5. **Sanitary Biology.** In this course those organisms, especially bacteria, which bear a causal relation to disease and the recent applications in sanitary science of our knowledge of the nature of these organisms, are considered. Some laboratory work in bacteriology is done.

Required of general and sanitary engineers in the Senior Class. Three hours weekly during the second term.

6. **General Geology.** The instruction in this course is adapted primarily to the study of the science as a branch of liberal culture, but enough practical work is included to afford a foundation for special study or for teaching. The work includes laboratory study in determining the common minerals and rocks, and some field work in structural and historical geology.

Required of Juniors in the A. B. and B. S. courses; elective in the Ph. B. course. Three hours weekly in the first term.

7. **Field Geology.** This course is supplementary to the preceding. The geological formations readily accessible from Schenectady are inspected, fossils are collected and readings from the State geological reports and other literature of the science are made.

Required of Ph. B. students who elect the preceding course. It may be taken as an extra, by permission of the faculty, by A. B. and B. S. students who have taken the preceding course. Three hours weekly during third term.

8. **Economic Geology.** In this course, after a brief study of the principles of dynamic and structural geology, the work is related to the occurrence and distribution in the United States of building stones, mineral ores, coal and other economic products. Recitations, lectures and some laboratory work. Required of Seniors in the B. E. courses. Two hours weekly during the first term.

## Physiology and Physical Training

DR. MCCOMBER

Human Anatomy, Physiology, Hygiene and Physical Training are required in all courses. In the Freshman year the work consists of recitations and lectures, demonstrated by means of the microscope, the manikin and the human skeleton. An attempt is made to give a practical course covering the essential facts of the subject with the idea of arousing in every student a genuine self interest, of developing a wholesome self respect without overwhelming him with the mass of details that must be considered in a close study of anatomy.

During the fall term of the Sophomore year a course in Hygiene is given designed to acquaint the student with practical laws concerning the preservation of health and to impress upon his mind the dependence of health upon the consistent observance of such laws. Knowledge is of little value unless it find some application. Lectures on "First Aid to the Injured," "Bacteriology," "Contagious and Infectious Diseases" and "Social Purity" form a part of the course.

It is the aim of the department to give the student such a training in the methods of Physical Education that he may have a comprehensive knowledge of the subject, and to secure



health, vigor and such harmonious development of the body as will fit it to resist disease, and prepare it for efficient service, both now and later in life.

Work in the gymnasium is required of Freshmen only, but the organization of voluntary classes makes it possible for all to secure the advantages of systematic exercise. The course in the gymnasium is so arranged as to give a knowledge of the different kinds of apparatus pertaining to physical training. Commencing with light work, consisting of free gymnastics, club, dumb-bell and wand exercises, the course leads through a graded series, involving heavier work as the student becomes fitted for it.

A physical examination of new students is made at the beginning of the year and corrective exercises are prescribed for the remedy of physical defects. Charts of the physical measurements showing the comparison of the individual with the normal development and hand books containing much valuable hygienic data are furnished upon payment of a small fee. All candidates for college teams are required to pass a satisfactory physical examination before they are allowed to compete in athletic contests.

It is the policy of the department, so far as the equipment will permit, to influence the entire student body to take an active part in athletic sports and gymnastics and not to cater to the exceptional athlete to the exclusion of those who are physically less perfectly equipped.

## LECTURES

It is the policy of the college to provide its students with the advantages of frequent lectures by specialists in the various departments of knowledge.

## THE LIBRARY

The library occupies Nott Memorial Hall. It contains forty thousand volumes and includes the engineering and scientific library of the late Professor Gillespie, the collection of mathematical works made by the late John Patterson, of

Albany; the library of the late Hon. Henry J. Cullen, of the class of 1860, and the library of ancient and classical language and literature of the late Professor Taylor Lewis. The income from a bequest of five thousand dollars left by the late Lemon Thomson, Esq., of Albany, of the class of 1850, is devoted to the purchase of books on American subjects, especially history and political science. An alcove, known as the "Thomson Alcove," is reserved for these books. By the will of the late Rev. Oscar Blakeslee Hitchcock, of the class of 1852, a bequest of upwards of thirty thousand dollars was left to the College for the purchase of books, manuscripts, etc. The most important accession of the past year is the "Croes Engineering Library," the gift of Mr. Edgar Beach Van Winkle of the class of 1860. The library is classified according to the Dewey decimal system.

One hundred and fifteen periodicals and the transactions of many learned societies are received.

### Library Rules

Hours 8-1; 2-6; 7-9 from Monday to Friday. 9-1; 7-9 on Saturday.

The library will be closed on Sundays and legal holidays.

The library will be open during vacation at hours to be announced.

Loan of books: Reference, Cullen and valuable books are not to be loaned.

Reserved books may be loaned over night, i. e., from 9 p. m. to 8 a. m. There will be a fine of \$1.00 per day or part of a day for each reserved book overdue.

Periodicals are regarded as reference books.

All other books may be loaned, not more than two at a time, for a period of two weeks, and may be once renewed, unless called for. A fine of ten cents per day will be charged for all books overdue and all library privileges will be withdrawn until the book is returned and the fine paid.



**THE NATURAL HISTORY MUSEUM**

PROFESSOR STOLLER, CURATOR

In Zoology, the collection of mounted birds numbers 311 specimens, representing 161 species of the bird fauna of the Eastern United States. Plans are now being made whereby these specimens will be reclassified and labelled. Of mammals there is a collection of 57 skins, the gift of the U. S. National Museum, and a number of skulls, skeletons and mounted specimens. Fishes, amphibia and reptiles, especially of the local fauna, are represented by specimens in alcohol. In the department of invertebrates the collections of marine animals made by Dr. Harrison E. Webster are extensive, including sponges, corals, worms, crustacea and mollusks, the total number of species represented being over 5,000. The Wheatley collection of shells, presented by E. C. Delavan, Esq., consists of 8,000 specimens. The botanical collections include a nearly complete set of local flowering plants, the work of Professor Jonathan Pearson. To this there has since been added a complete set of the ferns and fern allies of Schenectady County. The flora of the United States is further represented by collections from Virginia, the Red River region of the Southwest, and those made by Dr. Nevius in Alabama. The lower cryptogams are represented by a valuable collection of 2,300 specimens of fungi, the gift of Mr. J. B. Ellis, of the class of 1851. The Herbarium also includes a considerable number of foreign plants, including representative collections from Germany, Spain, Asia Minor and England, as well as some specimens from Iceland, Norway, France and Switzerland. They have been sorted and distributed in a single series following the latest accepted sequence, that of Engler and Prantl's *Natürliche Pflanzenfamilien*, making the entire collection of some 8,000 or 10,000 specimens readily accessible for reference and study.

In Mineralogy, the Wheatley collection of minerals given by E. C. Delavan, Esq., which is labelled according to the system of Dana, contains 4,000 specimens, many of which represent the more valuable forms.

In Geology there is a general collection of rocks and minerals, comprising some 3,000 specimens; and a considerable collection of Paleozoic and Mesozoic fossils. The collections made by the geological department under the direction of Professor C. S. Prosser so increased the museum that there is plenty of material now available, especially for the careful study of the Paleozoic rocks and fossils of the New York formations.

Recently there has been added the educational series of rock specimens, the gift of the United States Geological Survey.

CURRICULUM OF THE A. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 4 Solid Geom- etry 1 Physiology Greek Prose Composition Latin Prose Composition	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 4 Algebra 1 Physiology Greek Prose Composition Latin Prose Composition 1 Gymnastics	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 3 Trigonometry 1 Physiology Greek Prose Composition Latin Prose Composition 1 Gymnastics
Sophomore Year	3 Greek 3 Latin 3 German, or <sup>2</sup> French 2 English and Rhetoric 2 History or Mathematics 3 Physics 1 Hygiene	3 Greek 3 Latin 3 German, or <sup>2</sup> French 3 English and Rhetoric 2 History or Mathematics 3 Physics	3 Greek 3 Latin 3 German, or <sup>2</sup> French 3 English and Rhetoric 2 History or Mathematics 3 Physics
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>3</sup>	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>3</sup>	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>3</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Those entering Course A—see page 65, take French during Freshman Year and German during Sophomore Year. Those entering Course B—see page 65, take two years of that modern language not offered for admission.

<sup>3</sup>For list of electives, see pages 115, 116.

CURRICULUM OF THE PH. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Latin 3 German 3 French 2 Rhetoric 4 Solid Geometry 1 Physiology Latin Prose Composition	4 Latin 3 German 3 French 2 Rhetoric 4 Algebra 1 Physiology Latin Prose Composition 1 Gymnastics	4 Latin 3 German 3 French 2 Rhetoric 3 Trigonometry 1 Physiology 1 Gymnastics
Sophomore Year	3 Latin 3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 1 Hygiene	3 Latin 3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry	3 Latin 3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry
Junior Year	3 English and Rhetoric 3 Logic 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Psychology 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Ethics 3 Biology 7 Elective <sup>2</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see pages 115, 116.

CURRICULUM OF THE B. S. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 4 Algebra 3 Chemistry 1 Physiology	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 3 Analytic Ge- ometry 3 Chemistry 1 Physiology 1 Gymnastics	3 French <sup>2</sup> 3 German <sup>2</sup> 2 Rhetoric 3 Analytic Ge- ometry 3 Chemistry 1 Physiology 1 Gymnastics
Sophomore Year	3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology 1 Hygiene	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>3</sup> [3 German or French <sup>2</sup> ]
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Students who offer Latin at entrance take German *or* French, *one* of which is continued through Junior year.

<sup>3</sup>For list of electives, see pages 115, 116.

LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments.]

JUNIOR YEAR<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
3 German	3 German	3 German
3 French	3 French	3 French
3 Spanish	3 Spanish	3 Spanish
2 Anglo-Saxon	2 Anglo-Saxon	2 Anglo-Saxon
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Advanced Rhetoric— Argumentation	2 Advanced Rhetoric— Argumentation	2 Advanced Rhetoric— Argumentation
3 American His- tory	3 American His- tory	3 American His- tory
2 Modern Analytical Geometry	2 Advanced Calculus <sup>3</sup>	2 Differential Equations
2 Calculus <sup>2 4</sup>	2 Calculus <sup>2 4</sup>	2 Calculus <sup>2 4</sup>
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 General Geology	3 General Geology	3 General Geology
3 Biology <sup>3</sup>	3 Biology <sup>3</sup>	3 Biology <sup>3</sup>
3 Geology, As- tronomy, Evolution <sup>4</sup>	3 Geology, As- tronomy, Evolution <sup>4</sup>	3 Geology, As- tronomy, Evolution <sup>4</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week required for class work.

<sup>2</sup>For the A. B. course. <sup>3</sup>For the B. S. course. <sup>4</sup>For the Ph. B. course.



## LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments.]

SENIOR YEAR<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
2 Spanish	2 Spanish	2 Spanish
3 Spanish <sup>2</sup>	3 Spanish <sup>2</sup>	3 Spanish <sup>3</sup>
2 German or French	2 German or French	2 German or French
2 English Poetry	2 English Poetry	2 English Poetry
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Comparative Politics	2 Comparative Politics	2 International Law
3 European History	3 European History	3 European History
3 History of Philosophy	3 History of Philosophy	3 History of Philosophy
3 Advanced Psychology	3 Advanced Ethics	3 Evolution of Religion
2 Modern Analytical Geometry	2 Advanced Calculus	2 Differential Equations
2 Higher Plane Curves	2 Geometry of Three Dimensions	2 Theory of Functions
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
2 Physical Laboratory	2 Physical Laboratory	2 Physical Laboratory
3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 Organic Chemistry	3 Organic Chemistry	3 Organic Chemistry
3 General Geology	3 General Geology	3 General Geology
3 Morphology	3 Morphology	3 Morphology

<sup>1</sup>The figure at the left indicates the number of hours per week required for class work.<sup>2</sup>For the A. B. course.<sup>3</sup>For those who have not had Spanish in Junior year.



FOR THE  
CURRICULUM  
OF THE  
B. E. COURSES

See pages 180-189

## GENERAL REGULATIONS

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**Registration.** Every student must report at the Registrar's office at the beginning of each term and register college or local residence. Any change of residence during the term must be reported at once, in conformity with the regulation made by the Treasurer's office.

**Reports.** A daily record of scholarship and of attendance at class and chapel is kept, and is transmitted at the close of each term, or more frequently, to the student's parent or guardian.

**Standing.** There are four grades of scholarship:—from 9 to 10 inclusive, first grade; from 8 to 8.9, second grade; from 7 to 7.9, third grade; from 6 to 6.9, fourth grade. A student who receives a mark of 4 to 5.9 is reported as conditioned; below 4, as failed. In the mathematical studies of the engineering course the sustaining mark is 7, and any mark below 5 indicates failure.

A student who is reported as having failed in any subject must take that subject again in class; or he may be required, at the option of the department concerned, to make up the subject under an approved tutor, in such manner as the department may designate, and to pass an examination in the same at the second conditions examination after the imposition of the mark of failure.

Those receiving the three highest marks for the whole course in the Engineering Department and the seven highest marks in the other departments are entitled to appointment as Commencement Orators.

• **Absences in General.** Absences are entered (in every course) against a student from the beginning of a term until he reports his return to the Registrar.

Absences are recorded as of three kinds:—allowed, excused and unexcused. Excuses must be obtained from the Dean in writing.

**Class-room Absences.** Students will be allowed, each term, as many absences without excuse, in any subject, as there are recitations per week in that subject. But this rule does not apply to examinations, or to recitations just before or after any vacation or recess, or to any class as a whole at any time, and is not to be interpreted as remitting any part of the total work of the term.

Any absence not an allowed absence will be reckoned as a failure in recitation or in examination, as the case may be, unless excused by the Dean.

No excuse will be granted except for protracted illness, or for reasons in every way exceptional. The allowed absences are intended for cases of necessity only, and should not be used for other purposes in the expectation of receiving an excuse for a subsequent necessary absence.

When the total number of allowed and excused absences exceeds the number of recitations per week in that subject, the student will be required to take a special preliminary examination before he can proceed to his regular term examination.

After a number of unexcused absences equal to three weeks of recitations in any subject, the student will not be allowed to continue his work in that subject, but must take it with the succeeding class.

**Chapel Absences.** Twelve absences without excuse will be allowed each term. All absences after the first twelve lower the standing at the rate of one unit for every two absences.

No absences will be excused except for protracted illness or for reasons in every way exceptional.

In the determination of a student's general standing marks for chapel attendance are counted as the equivalent of a one hour per week recitation. They affect the granting of scholarships and the selection of honor men.

**Conditions.** Students admitted with entrance conditions are required to remove them not later than the examination for the removal of conditions in the following March. Students who fail to meet this requirement are classed as irreg-

ular students. No student who has any conditions unsatisfied at the close of the conditions examination in September at the opening of the college year, will be permitted to continue with his class without the express authorization of the Faculty.

Conditions not removed at the next conditions examination held after their imposition must be made up in class at the first opportunity, and this work shall take precedence of the regular work in case of conflict in the schedule. No Senior who has failed to make up all his back work by the end of the second term of Senior year can be recommended for a degree, except by special vote of the Faculty.

Examinations for the removal of conditions occur on the Saturday next preceding the opening of the fall term, and on the first Saturday in December, March and May, as indicated in the College calendar. Registration for these examinations closes at 2:30 p. m. on the Wednesday next preceding the date set for each. A fee for each examination to be taken must be paid at the time of registration, at the College Office.

Students who have been excused by the Dean, in writing, from any term examination will be reported "not examined" and may be examined later, at the option of the instructor, but such examination cannot be postponed beyond the first conditions examination. A failure to pass will be regarded as a condition which must be made up at the next following conditions examination.

Unless excused in writing by the Dean, students absent from term examinations will be reported as "Not sustained," or "Failed."

Any student permitted by the Faculty to anticipate or defer a term examination will be required to pay a fee for each special examination made necessary.

A failure to report at any appointed examination will be regarded as a trial, unless previously excused.

**Irregular Students.** Irregular Students have no class relation or class privilege; they are debarred from competition for prizes and from the attainment of special honors.

**Changes of Course.** Students are not permitted to pass from one course to another, or to take any studies out of their regular order, without the specific authorization of the Faculty.

The evidence that a student's continuance in college is resulting in no advantage to himself, or in harm to others, will occasion his separation from the institution.

## EXPENSES

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Matriculation fee .....	\$ 5.00
Tuition, A. B., Ph. B. and B. S. courses, per term....	25.00
Tuition, Engineering courses, per term .....	40.00
Graduate course in Electrical Engineering, per term..	50.00
Room rent, per year, North College.....	\$50.00 to \$60.00
South College, per year .....	60.00
Incidental fee, for maintenance of grounds and public rooms, use of library, gymnasium, etc., per term..	8.00
Graduation fee, including diploma .....	15.00
Chemical laboratory fees:	
Required course, No. 1 or No. 1a, per term.....	8.00
Required course, No. 2, in Civil, Sanitary and Elec- trical Engineering, Junior year .....	15.00
Required course, No. 5, in Sanitary Engineering, Senior year .....	15.00
Elective courses, No. 2, No. 3 or No. 4, per term..	15.00
Electrical Engineering laboratory fee, per term \$2.00 to	10.00
Biological laboratory fees:	
Required course, No. 1, per term .....	2.00
Required course, No. 5, per term .....	3.00
Elective courses, No. 2 or No. 3, per term .....	6.00
Physical laboratory fees:	
Required course, No. 2, per term .....	4.00
Elective course, No. 1a, per term .....	5.00
Conditions examination fee .....	2.00
Fee for certificate of work done .....	2.00
Fee for certificate of graduation .....	1.00

Students who take part of their Senior year's work at the Albany Medical College as provided on Page 67 are charged \$125 for the year's tuition, \$50 to be paid to the Treasurer of Union College and \$75 to the Treasurer of the Albany Medical College.

Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's

office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.

No deductions are made because of absence from college.

No part of a term bill will be refunded for any cause.

It is the custom of the student body to levy an annual campus tax of eleven dollars, five dollars of which is payable at the beginning of the fall term, three dollars at the beginning of the winter term, and three dollars at the beginning of the spring term. This money is used for the support of the different branches of athletics consisting at present of foot ball, basket ball, base ball and track.

Assistant Treasurer. On application, a list of rooms, giving location and price, will be furnished. It is very desirable that students about to enter College should secure their own room-mates before the College year opens. When this is not done the men will be located in the order of application. At the end of the College year students giving up their rooms for any reason whatsoever must remove all furniture and property from their rooms not later than the Saturday following Commencement Day, as after this time the



## EXPENSES

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Matriculation fee .....	\$ 5.00
Tuition, A. B., Ph. B. and B. S. courses, per term....	25.00
Tuition, Engineering courses, per term .....	40.00
Graduate course in Electrical Engineering, per term..	50.00
Room rent, per year. North College	\$50.00 to \$60.00

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Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's

office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.

No deductions are made because of absence from college.

No part of a term bill will be refunded for any cause.

Damage done by students to College property will be charged to their account.

No degree, certificate or dismissal will be given to any student until his bills are paid.

Board can be procured for \$4 to \$5 a week.

### **College Rooms**

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The College has two steam heated dormitories, accommodating ninety students. Most of the rooms are arranged in suites of two, and all are unfurnished; they are rented at prices varying from \$50.00 to \$60.00 per year for each student occupying a room. The rooms are cared for by competent persons, employed and paid by the College. No room is secured until a lease is signed and filed in the College Office. A student must occupy the room for which he signs, as transfers are not allowed. Each occupant of a College room will be held responsible for any damage done to the room. Students about to enter College who wish rooms in the dormitories should make early application to Charles B. Pond, Assistant Treasurer. On application, a list of rooms, giving location and price, will be furnished. It is very desirable that students about to enter College should secure their own room-mates before the College year opens. When this is not done the men will be located in the order of application. At the end of the College year students giving up their rooms for any reason whatsoever must remove all furniture and property from their rooms not later than the Saturday following Commencement Day, as after this time the

dormitories will be closed until the Saturday before the first registration day of the fall term. The dormitories will also be closed during the Christmas recess.

Students leaving property in their rooms during the vacations do so at their own risk.

### **Employment Bureau**

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An Employment Bureau has been organized, consisting of a Committee of the Faculty, the object of which is to assist students who are dependent, wholly or in part, upon their own efforts to meet the expenses of a college education. It has been found that many opportunities for work exist in Schenectady by which students may earn from \$2 to \$4 per week, during term-time, without seriously interfering with their college studies. A considerable number of students meet the expense of board by acting as waiters, at the noon hour, at the large restaurant connected with the works of the General Electric Co. Others find employment as clerks in stores on Friday evenings and Saturdays; others in caring for furnaces and in other work about private residences. Applications for assistance in finding work may be addressed to the Chairman of the Committee, Prof. James H. Stoller.

## **SCHOLARSHIPS**

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Funds given especially for this purpose enable the College to offer aid to a number of students each year, as follows:

### **General Scholarships**

**Available for students in the A. B., Ph. B. and B. S. courses**

Scholarships covering a part or the whole of tuition charges are granted to students upon the following conditions:

1. The declaration of a purpose to remain in Union College until graduation. (Credentials necessary for admission to another college will not be given to any scholarship student until he has repaid to the college treasury the full amount of scholarship aid received.)

2. An acknowledgment that the aid received is regarded as a debt of honor, to be paid as soon as possible after leaving college.

3. The presentation of satisfactory evidence of financial need.

Scholarship aid will be withdrawn temporarily upon the failure of the student to be sustained in any subject, or upon his failure to maintain an average grade of eighty per cent. in the studies of any term, and after it has been withdrawn for three successive terms it will not be renewed.

Any serious breach of college discipline, evidence of moral delinquency, or repeated unnecessary expenditures will also result in the withdrawal of scholarship aid.

Application blanks will be provided by the President or Dean upon request.

### **John David Wolfe Memorial Scholarships**

The income of a Fund of Fifty Thousand Dollars established by the generosity of Miss Catharine Lorillard Wolfe is designed to aid students from the Southern States.

The scholarships are governed by the conditions named above.

Application blanks will be provided by the President or Dean upon request.

### **Levi Parsons Scholarships**

A generous benefaction by the late Hon. Levi Parsons, of Gloversville, N. Y., maintains several scholarships in each class, yielding about one hundred and fifty dollars a year, each; this provides for tuition and a money payment each term.

Among applicants, preference is given:

First, to blood relatives of the founder, bearing his name and living in the county of Fulton, Montgomery or Hamilton, in the State of New York, and especially to those bearing his name and living in Gloversville or Johnstown, Fulton County.

Second, to applicants living in the following places, according to the following order:

1. The city of Gloversville, Fulton County.
2. The city of Johnstown.
3. The township of Johnstown.
4. The county of Fulton.
5. The adjoining counties of Montgomery and Hamilton.
6. To blood relatives living in any other part of the United States.

Nomination to scholarships is made by the Board of Directors of the Gloversville Free Library; and the nominees must pass satisfactory examinations at the College. Applications are received by the Directors of the Gloversville Free Library, Gloversville, N. Y.

These scholarships are governed by the conditions named on page 125.

### **Thomas Armstrong Scholarships**

The late Thomas Armstrong of Plattsburgh, N. Y., provided for the grant of scholarships to residents of Clinton County, sons of practical farmers. Nominations to these scholarships are made by the Board of Supervisors of Clinton County, and the yearly value of each scholarship is not to exceed two hundred dollars.

**R. C. Alexander Prize Scholarship**

The sum of four thousand dollars has been given in memory of the late Robert Carter Alexander, of the class of 1880, and a life trustee of the College, to be devoted to the establishment of a scholarship for the encouragement of classical studies.

The income of this fund, amounting to two hundred dollars per year, will be awarded as a prize scholarship, upon the following conditions:

**Conditions****governing the award of the R. C. Alexander Prize Scholarship**

1. Candidates must be students in the Classical course, and of approved moral character.

2. They must be free from conditions and must have obtained an average of at least eighty per cent. in the studies of the first two terms of the Freshman year.

3. They must pass successfully a special examination at the close of the Freshman year in each of the following subjects: Latin, Greek, Mathematics, English Composition, and either French or German. These examinations will be based upon the work of the Freshman year.

4. The award will be made to the candidate obtaining the highest general average in these examinations and in all the previous work of his college course.\*

5. The Prize Scholarship will be forfeited upon evidence of moral delinquency, or upon failure to maintain an average grade of ninety per cent. in the work of any subsequent term. The scholarship, once lost, cannot be regained, but will be awarded, upon the above conditions, to a student in the next entering class.

6. All questions pertaining to the administration of this

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\*This scholarship is now held by Elmer Wallace K. Mould, of the class of 1907.

scholarship will be determined by a committee composed of the President of the College, the Chairman of the Scholarship Committee of the Faculty, and a member of the Board of Trustees.

### **Horace B. Silliman Scholarships**

Three scholarships have been founded by the Hon. Horace B. Silliman, class of '46, giving to each recipient the income from two thousand dollars (\$2,000) annually.

These scholarships are to be awarded to active members of the college Young Men's Christian Association by a Committee composed of the President, the Dean, and the President of the Young Men's Christian Association, under such rules and conditions as shall be determined by such Committee, preference being given to students in the Classical course.

This year one of these scholarships will be awarded to a student in each of the three upper classes, and hereafter one will be awarded annually at the close of the Freshman year.



## **PRIZES**

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### **Blatchford Oratorical Medals**

The Hon. Richard M. Blatchford, LL. D., of New York city, founded oratorical prizes, consisting of two gold medals of the value of the interest on \$1,000, which are given to the two members of the graduating class who deliver at Commencement the best orations, "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals are awarded by a committee appointed by the Trustees, and are presented at the close of the exercises.

### **Warner Prize**

The Hon. Horatio G. Warner, LL. D., of Rochester, N. Y., founded an annual prize, consisting of silver plate of the value of \$28, to be presented at Commencement to the "graduate of Union College, Classical course, who shall reach the highest standing in the performance of collegiate duties, and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize is awarded by the Faculty.

### **Ingham Prize**

The Hon. Albert C. Ingham, LL. D., of Meridian, N. Y., founded an annual prize of the interest of \$1,000 (in the form of plate, or medal, or money, or both medal and money, as preferred), to be awarded at Commencement to that Senior connected with the College for not less than two years who shall offer the best essay on one of two assigned subjects in English Literature or History.

The essay must be typewritten, and must contain not less than 4,000 nor more than 4,500 words. Its signature (fictitious) and the writer's real name must be enclosed in a sealed envelope; the signature and the name of the prize being given on the outside. The essay, with the note, must be presented by noon on the fifteenth day of May.

**Allen Essay Prizes**

The Hon. William F. Allen, LL. D., of Oswego, N. Y., established a fund of \$1,000, the interest of which is devoted to prizes for the best three essays on any subject, submitted by members of the Senior class.

The essay must be typewritten, and must contain not less than 2,500 nor more than 3,000 words, and must be signed and presented (with note, as in the case of the Ingham Essay) by noon on May 15th. The prizes are awarded at Commencement.

**The Rankine Prize for Extemporaneous Speaking**

A prize of \$50 in money is awarded to that member of the College who shall deliver the best extemporaneous speech at a public competition to be held in Commencement week in each year. The award is made by a committee, and is based on the following considerations: (1) The appropriateness and correctness of the subject matter; (2) the logical force of the argument; (3) the excellence of the style; (4) the grace and effectiveness of the delivery. All students in regular standing are eligible. The number of competitors is, however, limited to ten.

**Oratorical Prizes**

Prizes are presented at Commencement to the two Juniors and the two Sophomores who deliver the orations best in composition and delivery on the occasion of Prize Speaking in Commencement week. Four Juniors and four Sophomores are selected for this competition by a committee of the Faculty on the fifteenth of April. Candidates must be in full standing on appearance before the committee.

**Allison-Foote Prize**

Founded by George F. Allison, of New York city, and Wallace T. Foote, of Port Henry, N. Y., for the encouragement of debate in the Literary Societies. The prize consists of \$100 in cash, and is to be awarded as the result of a public competition between representatives of the Adelpic and

Philomathean Literary Societies. Fifty dollars will be awarded to the society presenting the strongest argument. The remaining \$50 will be awarded to the debater who makes the best single speech, regardless of his society relations. Contestants must have engaged in at least ten debates in their respective societies during the college year immediately preceding. All further details are to be left to the determination of a committee, consisting of the President, the Dean of the College, and the Professor of Rhetoric.

### **Daggett Prize**

In 1899 Miss E. Josephine Daggett bequeathed to Union College the sum of \$1,000, the interest of which is devoted to a prize for conduct and character, without respect to scholarship, to be given at Commencement to a Senior who shall have passed through a full course of four years at the College.

## **LAW SCHOOL SCHOLARSHIPS**

Applicants for these scholarships, described below, must register at the College office by May 1st of Senior year.

### **John K. Porter Memorial Scholarships**

A fund given by Mrs. John K. Porter, in memory of her husband, is designed to assist students who, after graduating from college, pursue the study of law. The fund provides, at present, for three scholarships of ninety dollars each. The awards will be made at Commencement to Seniors chosen by the Faculty.

### **Gilbert M. Speir Memorial Scholarship**

A fund given by Mrs. Glover C. Arnold, in memory of her father, the last Judge Gilbert M. Speir, provides another scholarship for students of law who go from Union College to the Albany Law School, another department of Union University.

The sum of ninety dollars will be awarded at Commencement to the Senior chosen by the Faculty, the choice being made on the basis of excellence in historical studies.

## DEGREES AND HONORS

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The candidate for a degree must have paid all dues to the College Treasurer, and returned all books borrowed from the College Library; he must also attend the conferring of Degrees, or be expressly excused therefrom. The candidate for a bachelor's degree must have entered college before the end of the first Senior term.

### DEGREES FOR RESIDENT STUDY

The degrees of the College are conferred by authority of the Board of Trustees upon candidates who have successfully completed courses of resident study, as follows:

#### **The Bachelor's Degree**

The degree of Bachelor of Arts will be conferred upon candidates who have successfully completed Course 1, page 65; the degree of Bachelor of Philosophy, upon those who have successfully completed Course 2, page 65; the degree of Bachelor of Science, upon those who have successfully completed Course 3, page 65; the degree of Bachelor of Engineering, upon those who have successfully completed Course 4, 6 or 7, pages 65, 66; the degrees of Bachelor of Engineering and Bachelor of Philosophy, upon those who have successfully completed Course 5, page 66.

#### **The Master's Degree**

The degree of Master of Civil Engineering will be conferred upon candidates who have successfully completed Course 8, page 66; the degree of Master of Electrical Engineering, upon those who have successfully completed Course 9, page 66.

### DEGREES FOR NON-RESIDENT STUDY

The degree of Master of Arts or of Master of Science will be given to graduates of Union College who have been registered as candidates for the degree not less than two years, have completed definite courses of advanced study in two departments, and have submitted a satisfactory thesis and passed satisfactory examinations. The total amount of work done is intended to be the equivalent of one year of resident study.

A year of resident study in any non-professional graduate school, approved at the time of registration by the two departments concerned, will be accepted instead of the two years' study above mentioned on fulfilment of the same conditions regarding thesis and examinations.

Each candidate for this degree must register his name, address, and the two departments chosen, with the Dean of the College not later than the fifteenth of October of the year for which he desires registration.

The thesis must be presented to the Dean by May 1st for submission to the Faculty in time to provide for all necessary examinations before commencement.

A fee of \$20 is charged, which covers examinations and diploma; of this amount \$10 is payable at the time of registration and \$10 at the time of the final examinations.

### Honors

All commencement prizes are limited to A. B., Ph. B., or B. S. students who have entered at or before the beginning of the Senior year, and who are in full standing at the close of the second term; and to Engineering students entered likewise and in full standing at the close of the second term, in both the Engineering course and the English department of the B. S. or Ph. B. course.

### Commencement Appointments

These honors are assigned to ten Seniors on the basis of scholarship, as stated under Standing, page 118. Provi-



sional appointments are made at the close of the second term Senior, and become final if those who receive them retain the same relative rank to the end of their course. Under present regulations, no other persons can become competitors for the Blatchford Oratorical Medals.

Seniors not in full standing at the close of the second term shall be considered ineligible to a Commencement appointment.

Places gained as the result of the third term's work shall be on the excused list, unless ordered otherwise by special vote of the Faculty.

### **The Valedictory**

This honor is awarded to the Senior of highest standing among the ten receiving Commencement appointments.

### **Special Honors**

Special Honors are also given at graduation in each of the following subjects: Greek, Latin, English Language, English Literature, French, German, Mathematics, Physics, Chemistry, Biology, Economics, History, Sociology and Philosophy. The work required in each case will be equivalent of three terms of class-room work of two hours per week each, and will be outside of the prescribed or elective courses. The candidate for Special Honors must apply to the head of the department in which he proposes to take Honors not later than the first Monday of the Spring term of the Junior year. He must have attained in all the studies of the department in which he tries for Honors a rank of not less than ninety per cent. of the maximum. The evidence that he has successfully completed the extra course prescribed for him must be submitted not later than June 1st of the Senior year to the Faculty, who shall decide in each case whether the work done is worthy of an Honor. The Honors attained are stated in the diploma, and the names of the students who take Honors are printed on the Commencement programme.

**Phi Beta Kappa Society**

At the end of the third term of the Senior year, one-third of the members of the graduating class in the classical course, candidates for the degree of Bachelor of Arts, may be elected to membership in the Phi Beta Kappa Society. The election is based upon scholarship and character and is given, as a rule, to the men who stand highest in scholarship in their class.

The Alpha of New York Chapter was established in 1817; and ever since that time election to the society has been one of the highest distinctions to be gained by scholarship.

**Sigma XI**

Election to the honorary scientific Society of Sigma XI, is one of the honors open to Seniors of marked ability in the Scientific and Engineering departments. Membership is confined to the Faculty, Senior candidates for graduation, and Alumni. The election occurs during the latter part of the Senior year and selections are made on the basis of high general scientific or engineering ability and particularly as a mark of promise of ability in research and independent work.

The Society was founded at Cornell University in 1886 and has chapters at more than twenty of the leading colleges and universities of the country. The Union chapter was established in 1887, since which time about one hundred members have been elected by this chapter.



## DEGREES CONFERRED

AT THE  
ONE HUNDRED AND TENTH ANNUAL  
COMMENCEMENT

June 13, 1906

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## HONORARY

## LL. D.

GEORGE B. McCLELLAN.....New York City

## D. D.

HENRY R. FANCHER.....Batavia

LEANDER HALL.....New York City

B. W. R. TAYLER.....Schenectady

## Litt. D.

HOMER GREENE.....Honesdale, Pa

## Sc. D.

CHARLES S. PROSSER.....Columbus, O

EDWIN W. RICE, JR.....Schenectady

C. J. H. WOODBURY.....Boston, Mass

## IN COURSE

## M. E. E.

MORLAND KING.....Class of 1905

## CLASS OF 1906

## A. B.

PHILIP LUKE CLASSEN.....Albany

HARRY COOK.....Albany

PAUL JONATHAN HAGAR.....Plattsburg

JOHN FAY PUTNAM.....Johnstown

BYRON WILLIAM REED.....Olean

WALTER FANSTONE WELLMAN.....Schenectady

## Ph. B.

GEORGE WALTER HITT.....Unadilla

DANIEL FERGUSON IMRIE.....Caldwell

PAUL ALONZO MEAD.....Schenectady

FLOYD LESLIE MILLER.....Fort Plain

MEADE LAFAYETTE ZIMMER.....Gallupville

B. S.

WILLIAM LEROY BROOKS.....	Albany
CHARLES STEVENS DWIGHT.....	Columbia, S. C
LEON RAY LEWIS.....	Gilboa
HERRICK McCLENTHEN.....	Jefferson
LORENZO N. RIDER.....	Bath
GEORGE ARTHUR VEDDER.....	Schenectady

B. E.

LEROY BEERS.....	Schenectady
MELVIN DAVID CASLER.....	Johnstown
ARNOLD G. CHAPMAN.....	Guilderland
EDGAR STONE CLOSSON.....	Gloversville
ERNEST MONTGOMERY DANN.....	Downsville
CLARENCE R. DARBY.....	Rochester
EDGAR W. EARLE.....	Lancaster
JAMES M. GAGEN.....	Amsterdam
HARRY NELSON HAIGHT.....	Fishkill
GEORGE FRANCIS HALL.....	Albany
LESLIE GILBERT HOLLERAN.....	Hadley
CLAUDE KINNE HUSTON.....	Selma, Ala
ALFRED J. KAUFMAN.....	Rensselaer
WARNER KING.....	Brooklyn
THIAGO VIEIRA MONTEIRO.....	Brazil
JOHN LESLIE MOON.....	Cooperstown
GEORGE CHAPMAN NEWBURY.....	Goshen
WALTER ERNEST NUTT.....	Cohoes
JOHN ALOYSIUS O'DONNELL.....	Salem
JOHN BRADBURY PEEBLES.....	Petersburg, Va
LEIGHTON HARTWELL PEEBLES.....	Petersburg, Va
JOHN HENRY RAY.....	Rheims
SAMUEL JOHNSON RAYMOND.....	Buffalo
RAYMOND DERRICK SHERMAN.....	Melrose
WILLIAM EDMUND STONEY.....	Pinopolis, S. C
HARRY ADELBERT SYLVESTER.....	Schenectady
CARL OTTO VON DANNENBERG.....	Stapleton
JOHN GIBBON WEBB.....	Summerville, S. C
NELSON PHILIP WEIER.....	Lyons

## AWARDS

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### Valedictory

HARRY COOK.....Albany

### Commencement Orations

DANIEL FERGUSON IMRIE.....Caldwell

WARNER KING.....Brooklyn

LEON RAY LEWIS.....Gilboa

FLOYD LESLIE MILLER.....Fort Plain

BYRON WILLIAM REED.....Olean

### Engineering Theses

MELVIN DAVID CASLER.....Johnstown

ARNOLD G. CHAPMAN.....Guilderland

ERNEST MONTGOMERY DANN.....Downsville

WARNER KING.....Brooklyn

LEIGHTON HARTWELL PEEBLES.....Petersburg, Va

### Special Honors

In Latin.....	{	HARRY COOK DANIEL FERGUSON IMRIE
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In English..... FLOYD LESLIE MILLER

In History.....	{	HARRY COOK LEON RAY LEWIS HERRICK MCCLINTHEN FLOYD LESLIE MILLER JOHN FAY PUTNAM
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In Mathematics..... MEADE LAFAYETTE ZIMMER

In Biology.....	{	DANIEL FERGUSON IMRIE LEON RAY LEWIS BYRON WILLIAM REED
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**Warner Prize**

For Seniors

HARRY COOK

**Blatchford Oratorical Medals**

For Seniors

1st. BYRON WILLIAM REED

2d. LEON RAY LEWIS

**Ingham Prize**

For Seniors

WILLIAM EDMUND STONEY

**Allen Essay Prizes**

For Seniors

1st. FLOYD LESLIE MILLER

2nd. WALTER FANSTONE WELLMAN

3d. HERRICK MCCLENTHEN

**Daggett Prize**

ERNEST MONTGOMERY DANN

**Junior Oratorical Prizes**

1st. GLENN ELLISON RICHARDSON

2d. ALBERT HUNTLEY WHITE

**Sophomore Oratorical Prizes**

1st. BYRON ALONZO COLLINS

2nd. MARK SKINNER WATSON

**Allison-Foote Prizes**

Won by the Adelpic Society  
and

BYRON WILLIAM REED

Class of 1906

**R. C. Alexander Prize Scholarship**

ELMER WALLACE K. MOULD

Class of 1909

**John K. Porter Memorial Scholarships**

DANIEL FERGUSON IMRIE

LEON RAY LEWIS

HERRICK McCLENTHEN

**Gilbert M. Speir Memorial Scholarship**

HARRY COOK

**The Rankine Prize for Extemporaneous Speaking**

RAYMOND O. SHELLEY

**Phi Beta Kappa**

From the Senior Class

HARRY COOK

BYRON WILLIAM REED

**Sigma Xi**

From Class of 1898

AUGUST H. KRUESI

From the Senior Class

MELVIN DAVID CASLER

ARNOLD G. CHAPMAN

CLARENCE R. DARBY

DANIEL FERGUSON IMRIE

WARNER KING

LEON RAY LEWIS

LEIGHTON HARTWELL PEEBLES

CARL OTTO VON DANNENBERG

SCHOOL OF ENGINEERING

UNION COLLEGE

SCHENECTADY, N. Y.

**FACULTY**

---

ANDREW V. V. RAYMOND, D. D., LL. D.  
President

OLIN H. LANDRETH, A. M., C. E., Sc. D.  
Professor of Civil Engineering

CHARLES P. STEINMETZ, A. M., Ph. D.  
Professor of Electrical Engineering

BENJAMIN H. RIPTON, Ph. D., LL. D.  
Dean and Professor of History and Sociology

WILLIAM WELLS, Ph. D., LL. D.  
Professor Emeritus of Modern Languages and Literature

THOMAS W. WRIGHT, A. M., Ph. D.  
Professor Emeritus of Mathematics

FRANK S. HOFFMAN, A. M., Ph. D.  
Professor of Mental and Moral Philosophy

JAMES H. STOLLER, A. M., Ph. D.  
Professor of Biology and Geology

EDWARD EVERETT HALE, JR., Ph. D.  
Professor of the English Language and Literature

HOWARD OPDYKE, A. B.  
Professor of Physics

EDWARD ELLERY, A. M., Ph. D.  
Professor of Chemistry



FRANK COE BARNES, A. M., PH. D.  
Professor of Modern Languages

FRANK B. WILLIAMS, C. E., M. S., PH. D.  
Professor of Engineering Mathematics

HORACE GRANT McKEAN, A. M.  
Professor of Rhetoric and Public Speaking

JOHN LEWIS MARCH, A. M., PH. D.  
Adjunct Professor of Modern Languages

ELMER E. F. CREIGHTON, B. S., E. E.\*  
Assistant Professor of Electrical Engineering

JOHN W. HUGHES, B. S. in C. E.  
Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. in E. E.  
Assistant Professor of Electrical Engineering

SAMUEL E. WEBER, B. S. in M. E.  
Instructor in Civil Engineering

WALTER M. CURTIS, S. B.  
Instructor in Mechanical Engineering

DANIEL A. YOUNG, B. S. in C. E.  
Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.  
Instructor in Physical Culture

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\*Absent on leave.

JAMES H. CUNNINGHAM, B. E.  
Instructor in Electrical Engineering

MORLAND KING, B. E., M. E. E.  
Instructor in Electrical Engineering

CYRUS A. MELICK, C. E.  
Instructor in Civil Engineering

---

Instructor in Modern Languages

ALBERT S. EASTMAN, B. S.  
Assistant in Chemistry

DAVID HUTCHISON, A. M., B. D.  
Assistant in History

HAMILTON W. MABIE, LL. D.  
Lecturer on English Literature

E. J. BERG  
Lecturer on Electrical Engineering Practice

M. F. WESTOVER  
Lecturer on Organization and Management of Corporations

E. WEINTRAUB, PH. D.  
Lecturer on Electrochemistry

J. L. R. HAYDEN  
Lecturer on Arc Lighting and Photometry and  
Supervisor of Electr. Eng. Thesis work.

## INTRODUCTORY

The charter of Union University brings together under one corporate name and administration Union College, located at Schenectady, N. Y., and the Law School, the Medical College, the Dudley Observatory and the College of Pharmacy, all located at Albany, N. Y.

The Engineering School forms a part of Union College. Its connection with the regular college courses and with the other members of the university group is considered an advantage, as it has a broadening influence and furnishes opportunities for general culture not usually available in a purely technical school.

## HISTORICAL

When Union College was chartered, in February, 1795, the only American colleges west of the Hudson River were William and Mary, Princeton, Hampden-Sidney, Rutgers and Dickinson. These, as well as the New England colleges were all denominational; Union was the first strictly non-sectarian American college, and its name was inspired in part by this novel characteristic. The first full professorship in natural science in an American college was founded at Union, and it is a matter of special scientific interest that Prof. F. R. Hassler was called from this chair in 1811 to establish the U. S. Coast Survey.

The engineering school of Union College is one of the oldest technical schools of the country. Founded in 1845 with Prof. William M. Gillespie at its head, it at once took high rank, and for many years was one of the few engineering schools in America. From the first it appears to have been the evident policy of the school to adapt the thorough training of L'École des Ponts et Chaussées, of Paris, France, where Prof. Gillespie had finished his technical education, to the demands of professional practice in a vigorous new country, where resources and opportunities were abundant, and where capital and professional precedent were wanting.

From the characteristic tendencies impressed on the school at its foundation it has never departed, although it has endeavored to keep pace with the development in American technical education and with the increased demands on professional training. For many years Civil Engineering only was taught; then, as the principles of modern sanitary science came to be better understood and the possibilities of their further development and their utilization as life-saving agencies were discerned, a course in Sanitary Engineering, was established; and more recently a course in Electrical Engineering, just now being extended, was added.

During its whole history the school of engineering at Union has stood for broad, fundamental training rather than for narrow specialization and during recent years, since its advanced entrance requirements have made room in the course, increased time and attention have been given to culture studies and to a larger proportion of academic training.

## DESCRIPTIVE

**Local Advantages.** Schenectady is a peculiarly favorable location for an engineering school. The city is on the Mohawk River, and is intersected by several steam railroads, a number of interurban electric trolley lines and the Erie Canal, furnishing many bridges and other engineering works. At Schenectady are also located the works of the General Electric Company and of the American Locomotive Company, each an extensive and leading industry in its respective line. Among other interesting engineering features may be mentioned the city grade-crossings improvement now approaching completion at a cost of a million dollars, and the city waterworks, which contain in their outfit a system of ground-water wells and a recently installed set of electrically-driven multiple-stage centrifugal pumps, of twenty million gallons daily capacity. The neighboring cities of Albany, Troy and Cohoes, as well as the surrounding territory, offer numerous examples of good engineering and many features of value as

aids in engineering training. Among these may be mentioned the Scientific Departments of the State Government at Albany, including the headquarters of the State Engineer's Department and of the new Barge Canal; the State Library; the Albany City Water Filtration Plant; at Troy the Burden Iron Works; the Steel Plant; the Gurley Engineering Instrument Manufactory; at Watervliet the United States Arsenal and Gun Factory; the Water Power Developments and Electric Power Transmission Plants at Mechanicville and Spier Falls; the Hydraulic Cement Works at Glens Falls and at Howe's Cave; and the Modern Sewage Disposal System at Saratoga Springs. It is expected that the new barge canal will pass the Cohoes Falls by a flight of locks and will pass Schenectady by a system of locks and dams in the Mohawk River, calling for extensive and interesting engineering operations. All these sources of aid are utilized in the work of the school.

**Alternate Courses of Study.** Four undergraduate courses of study in engineering are offered, three extending through four years and one extending through six years:—(1) A four-years course in general engineering, which is intended to give the basis of a broad engineering education, including the fundamental principles underlying the special branches of the profession; (2) A four-years course in sanitary engineering which differs from the general engineering course by substituting special work in sanitary subjects for some of the general engineering studies; and (3) a four-years course in electrical engineering, in which the last two years are devoted to essentially mechanical and electrical engineering subjects.

These three courses are identical during the first two years, the sanitary course differing slightly from the general during the last two years, while the electrical course in its last two years differs widely from the other courses. The degree of Bachelor of Engineering (B. E.) is given for the successful completion of any one of the above three courses.

A six-years course in general engineering is also offered comprising the above four-years course in general engineering, course (1), and the regular four-years Latin-scientific

course of the Academic Department, with the subjects of the two courses properly interwoven during each term. The course thus offers a combined college and technical training with the subjects of the two properly correlated. The degrees of Bachelor of Engineering (B. E.) and of Bachelor of Philosophy (Ph. B.) are given on the satisfactory completion of this course.

In addition to the above undergraduate courses in engineering, two post-graduate courses and degrees are offered:

The degrees of Master of Civil Engineering (M. C. E.) and of Master of Electrical Engineering (M. E. E.) are given on the satisfactory completion of one-year's graduate courses of study in Civil Engineering and in Electrical Engineering, respectively.

**General Education and Technical Training.** In the training of a young man for his professional work two distinct methods are open. One is to separate his professional work from his general educational training and to complete the latter before the former is commenced. This is the plan followed in the professional schools of theology, law and medicine. The other plan is, after the student has reached a certain point in his studies, to have him carry forward at the same time his general education and his technical training. This plan is the one generally followed in engineering schools, as it has been found by engineering educators and professional engineers to yield better results in practice than the former plan. The point selected at which the technical training shall commence is the beginning of the college course, the time of which is divided between general studies and technical studies. In the Union College engineering courses the time allotted to the two divisions is about equal, though the two are carried on simultaneously, the general training receiving, however, more time in the early part of the course and less in the latter part.



## **REQUIREMENTS FOR ADMISSION TO THE ENGINEERING SCHOOL**

### **COMMON TO ALL ENGINEERING COURSES**

**General Conditions for Admission.** The general conditions governing admission to the Engineering School are stated in detail on page 68.

**Requirements for Examination.** Candidates for admission to the Freshman class in any of the Engineering courses are required to pass satisfactory examinations in, or present approved certificates covering, the following subjects:

English Literature, Arithmetic, Algebra, Plane and Solid Geometry, Plane Trigonometry, Physics, German or French, History of the United States, Modern Geography, and Physiology, as given in detail on pages 69-78.

Candidates for admission to the Freshman class of the six-years' undergraduate course are required, in addition, to pass a satisfactory examination in or present approved certificates in Latin (3) page 71.

## **EXPENSES, TERMS AND VACATIONS**

For information regarding expenses, and terms and vacations, see pages 122, 123, and pages 7, 8, 9.

## **STUDIES OF THE THREE COURSES**

### **OUTLINE DESCRIPTION**

The following is an outline of those studies which in general are common to the three courses, in General, Sanitary and Electrical Engineering. The studies which are peculiar to each are outlined under the separate departments.

Following the distinction between the two kinds of training above mentioned, the studies here outlined are arranged under the two heads of General Studies and Technical Studies.



**GENERAL STUDIES**

**Physics.** The instruction in physics comprises a series of lectures on experimental physics, accompanied by classroom and laboratory work. Physical laboratory work is required of all engineering students. See also pages 100-101.

**Chemistry.** General chemistry is taught by lectures, recitations and laboratory work during the Freshman and Sophomore years and laboratory work in qualitative analysis is continued through the first term of the Junior year. Sanitary engineering students in addition to the above take chemical laboratory work during the first and second terms of the Senior year. See also pages 101-104.

**Astronomy.** The instruction in astronomy includes physical astronomy, spherical astronomy and the theory of astronomical instruments. These studies are preparatory to the work in astronomical surveying and geodesy given in the general engineering course. In the electrical engineering course the work is confined to descriptive astronomy.

**Biology.** Physiology is a required study in each of the three engineering courses. Structural botany is given in the general and sanitary courses, and bacteriology is given in the sanitary course. Structural botany includes the microscopic study of the vegetable cell, the tissues and the tissue-system of the higher plants with special reference to the use of woods in the constructive arts. In bacteriology some of the common bacteria of water, air and soil are studied according to the methods of modern bacteriological work. The accompanying lectures treat of bacteria in regard to their place and role in nature and their relations to sanitary science. See also pages 104-107.

**Geology** (not required in the electrical engineering course). This work comprises a course in economic geology, which includes the general principles of geology and a discussion of

the occurrence and distribution of minerals and mineral materials for construction in the United States. See also pages 104-107.

**English.** The instruction in English aims at a general acquaintance with English literature and a correct, clear and forcible use of the language. Rhetoric is studied throughout the Freshman year. In the first term a summary review of diction is given. In the second and third terms more attention is given to the development of thought by work upon kinds of composition and the paragraph. In the Sophomore year English Literature as represented by the work of the essayists and by Shakespeare is studied. In the Senior year one of the required essays of each term will be upon a technical subject prepared under the direction of the professor of Civil Engineering, the object being to give the engineering student practice in the preparation of clear, concise and systematic reports on engineering subjects. See also pages 88-91.

**Modern Languages.** All engineering students at the time of entrance must have had two years of either French or German. After entering they are required to pursue French and German each for one year. This will be advanced work for the language offered at entrance, and elementary work in the alternate language not offered. Some work in scientific French and scientific German is done during the latter part of the course. See also pages 82-88.

**Physiology and Physical Training.** See page 104.

## **MATHEMATICAL AND TECHNICAL STUDIES**

The following mathematical and technical subjects are included in each of the three engineering courses; and the instruction therein, with the exception of that in Electrical Laboratory, is given in the General Engineering Department.

## Mathematics

PROFESSOR WILLIAMS, INSTRUCTOR MELICK AND INSTRUCTOR YOUNG

To the engineer the subject of mathematics is essential not only for its disciplinary training, but also for its practical applications and use. Both these features receive due consideration in the teaching of the subjects under this head, especial effort being made to incite the student to independent thinking, and to enable him to apply his knowledge of mathematics to his technical work, at the same time holding him to rigorous methods and logical conclusions.

The following courses are given:

1. *Algebra*, including elements of determinants, Downey's *Algebra*.

Required of Freshmen. Four hours weekly during first term.

2. *Trigonometry*. Murray's *Trigonometry*.

Required of Freshmen in addition to the trigonometry required at entrance. One hour weekly during third term.

3. *Analytic Geometry*. Tanner' and Allen's *Analytic Geometry*.

Required of Freshmen. Four hours weekly during second term, and two hours weekly during third term.

4. *Calculus*. Murray's *Infinitesimal Calculus*.

Three hours weekly during third term of Freshmen year, three hours weekly during first and second terms, and two hours weekly during third term of Sophomore year.

5. *Analytical Mechanics*. The subjects taught under this head are statics, dynamics, hydro-statics, hydro-dynamics, pneumatics. These studies form the foundation for the technical studies of applied mechanics, strength of materials and stresses in framed structures, all of which are fundamental to one of the Chief divisions of an engineer's duties, namely, that of designing.

Required of Sophomores. Three hours first term, two hours second term and one hour third term.

**Drawing and Descriptive Geometry.** The instruction in this work extends through the entire course. In the first term of the Freshman year the student is instructed in free-hand drawing and in freehand lettering. In the second term he is instructed in the use of drawing instruments, in orthographic projections and in construction of geometrical problems and instrumental lettering. In the third term Freshman and first term Sophomore he is given practice in plotting surveys made in the field. Further instruction in topographical drawing follows in the first term of the Sophomore year. Descriptive geometry is begun in the second term Sophomore and, in addition to instruction in the theory, some of the most common applications in practice are taught by the use of practical problems. Schroeder's models and the Olivier models, as well as the models of intersections of the Paris Polytechnic School, are freely used. In the third term Sophomore instruction is given in shades, shadows and perspective and in the theories of oblique projections.

**Mensuration and Surveying.** This work is begun in the second term of the Freshman year by the study of pure and applied mensuration, together with the fundamental principles of error, precision and computations, illustrated by practice. In the third term the theory of surveying instruments and operations is taken up and illustrated by field practice with the chain, tape, compass, transit, level and rod. In the first term Sophomore topographical surveying is commenced and instruction and practice are given in the use of the various methods and instruments.

As a preliminary to instruction in each branch of surveying a thorough study of the instruments employed is made, treating their geometrical, optical and mechanical relations; their adjustments and use; and the determination of their instrumental constants, errors and limits of precision. The classes are divided into small sections and directed by the instructors. Office computations, plotting and mapping are made adjuncts of the field surveys.

**Applied Mechanics and Materials.** Applied mechanics is commenced in the first term of the Junior year, and comprises the extension of analytical mechanics and the development of the methods of graphical analysis with their applications to engineering problems, operations and constructions, particularly the treatment of stresses, strains, deflections and deformations in elastic materials and structures due to extraneous forces.

In conjunction with this work is given the study of the production, preparation, strength and physical properties of the various engineering materials, including timber, stones, cement and lime mortar, cast iron, wrought iron and structural steel. Practice in the engineering laboratory is an important adjunct to this study.

This entire division, properly correlated, becomes the foundation of all rational engineering design and construction.

**Engineering Law and Procedure.** During the first and second terms of the Freshman year and the third term of the Senior year a series of lectures is given on topics pertaining to the training and the qualifications of engineers, and to engineering practice. In the Junior and Senior years in Option B, and in the third term of the Senior year of Option A, a course is given in the study of the elements of the law and principles of procedure in contracts, agency, corporations, commercial and financial transactions and industrial accounting and of the law relating to land boundaries and titles, water courses and surveys.

**Electrical Laboratory.** Electrical laboratory instruction is given to all Sophomore Engineering students for the purpose of increasing their acquaintance with electrical machinery and apparatus by laboratory exercises. The course is described on page 168.

**Voluntary Studies.** Any of the studies of the classical course or of the scientific course of the college may be taken by engineering students without extra charge.



**Final Examinations.** During the Senior year a series of final examinations will be held covering the more important subjects of the entire course. The list of subjects in which examinations are to be given during any term will be determined by the faculty.

**Theses.** Each candidate for graduation is required to present on or before the first Wednesday in June of his graduation year a satisfactory thesis on a subject that has been approved by the professors of Civil Engineering or of Electrical Engineering. This thesis must be original in its character and may be either a design for some engineering structure or plant, process or operation, or an independent investigation of some principle, problem or matter of engineering importance. Reviews or copies of existing structures, plants or processes, unless of special educational value or involving original investigation, will not be approved as subjects. This thesis is to be in a form prescribed at the time of approval of the subject, and is to be bound for deposit in the library of the engineering school, and must be presented in this shape on or before the stipulated date. The subjects, with outlines of the proposed treatment, must be submitted for approval not later than January 1st of the graduation year, and the work on the theses must be presented for inspection and criticism of the professor in charge of the department at intervals during progress.

### **Library**

The students have the use of the College and Society Libraries. The former contains the Engineering and Scientific Library of the late Professor Gillespie and other valuable technical collections. See page 108.

## GENERAL ENGINEERING DEPARTMENT

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**Two Alternate Courses.** Two alternate courses or options are offered in general engineering, either of which may be selected by general engineering students at the beginning of the Junior year, and each of which extends through the Junior and Senior years. The first of these alternate courses, designated as "Option A," offers a broad, fundamental, general engineering training such as a thoroughly trained engineer should have before specializing in any of the branches of the profession. The other alternate course, designated as "Option B," while in the main identical with the former, differs from it by omitting some of the more technical subjects, such as stereotomy, kinematics, least squares, sewerage, geodesy and field astronomy, and by substituting therefor, sociology, the elements of law, political science and international law, the principles of finance and financial operations, the principles of business management and accounting, and additional work in history and in engineering law and procedure. The object of this alternate course is to offer to engineering students an opportunity better to qualify themselves for engineering positions of an executive or administrative character. These two options are also offered in the six-years general engineering course and extend through the fifth and sixth years.

The details of these two optional courses will be found later on pages 181, 182.

In addition to the studies common to all engineering courses previously described on page 149, the following subjects are included in the general engineering course. Unless otherwise stated, the following studies are required in each of the two alternate courses in General Engineering:

**Drawing and Descriptive Geometry (continued).** In the Junior year work in drawing includes machine drawing and the solution of problems in graphical analysis. In the Senior year the subject includes the work in engineering de-



sign and construction of the last two terms, and comprises a large amount of structural drawing in the development of the designs of engineering structures. A course in stereotomy and stone cutting is given in the first term Senior, with drawings from the stereotomy models of the Paris Polytechnic School. Practice in blue printing is made a part of these courses.

**Surveying (continued).** Railroad surveying is treated in the third term of the Junior year, and the students are given exercises in the proper field operations on railroad surveys, office and field location and staking out work for construction. The subject of railroad construction and equipment is not treated until the first term of the Senior year.

**Least Squares, Geodesy and Field Astronomy.** This course is given three hours weekly, during the second and third terms of the Senior year. After a study of the fundamental principles of the adjustment of errors and their use in finding the weights and probable errors and in establishing empirical formulas, a discussion of the figure of the earth, triangulation, base lines, and precise leveling is taken up, accompanied by field work which also includes the determination of time, latitude, and azimuth, with ordinary instruments and with methods and instruments of an observatory.

**Engineering Design.** The course in applied mechanics and materials prepares the student to undertake the study of engineering design proper, which is pursued throughout the Senior year; an important feature of this course is the work in bridges, railroads and water-power developments, architectural engineering, etc. The exercises in this line of work are, as far as possible, chosen from professional practice, and the student is expected to carry out, from assigned data and conditions, the preliminary study, determinations of stresses, types, dimensions and details, and to turn in the results in the form of working drawings, diagrams and memoirs. The department possesses a large collection of drawings and

photographs of representative engineering structures from which students can form correct ideas of modern practice in the designing of details and in the methods followed on works of this class.

**Water.** The subject of water is considered from several standpoints. In the first term Junior is given a laboratory course in chemistry, followed by a course in water analysis. In the third term Junior is given a course in hydraulics, followed in the Senior year by a fuller development of the subject as applied to rainfall, run-off and storage of water, in relation both to water power and to potable water supplies. This course is accompanied by a study of the sanitary aspects of the subject of water supply and its preservation from contamination. An outline study is also made of pumping engines.

**Highways.** The study of highways in the first term of the Junior year comprises a consideration of the highway as an element in the transportation system of the State, the principles of its economic location and proper construction, a study of the various modes of construction and the materials employed, its proper maintenance and systems of highway laws and administration.

As a preliminary to the study of highway location as well as of railroad and route surveying, some consideration is given to the principles and fundamental laws of topographical types and forms and their relation to the various modes of earth sculpture.

**Streets and Pavements.** A study of the methods of laying out and grading streets and pavements and of the various street accessories, paving methods and materials and their treatment, with special reference to their economic and sanitary aspects, is also given during the first term of the Junior year.

**Motors and Motive Power.** Following the work in thermodynamics and hydraulics of the third term of the Junior year an outline course in motors and motive power is given in the first and second terms of the Senior year, comprising a study of the sources of demand and supply of power, steam-boilers, steam-engines, steam turbines, water-wheels and turbines, gas-engines, electric motors and transmission of power by shafting, belting, rope-drives, compressed air and electricity.

**Electrical Machinery and Transmission.** Following the instruction in electricity in the Department of Physics, General Engineering students are given, during the second term of the Junior year, a course in the fundamental principles and practice of electrical generators, motors, transformers, transmission and instruments.

**History and Economics.** American history throughout the Junior year and economics during the first term of the Senior year are required of all general engineering students.

**Sociology, Political Science and International Law.** General engineering students who elect "Option B" in engineering administration are required to have sociology during the last two terms of the Junior year, political science during the first two terms of the Senior year, and international law during the last term of the Senior year.

**Principles of Finance, Business, Accounting.** General engineering students who elect "Option B" are given instruction in the principles of finance and financial operations, the principles of business and of industrial organization, and the principles of accounting and of cost-keeping during the second and third terms of the Senior year.

### **Instruments and Apparatus**

The department is supplied with field instruments of the best description, comprising a large theodolite, suitable for refined geodetic operations, transits, surveyors' compasses,

prismatic compasses, Burnier's compass, solar compass, Y levels, the levels of Troughton, Egault, Lenoir and Burnier; plane tables, sextant, octant, mountain barometers, aneroid barometer and a marine chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie has been purchased for the Engineering School.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important:

**The Olivier Collection.** This consists of about fifty models, representing the most important and complicated ruled surfaces of Descriptive Geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved, to which are attached silk threads representing the elements or successive positions of the generatrices of the surfaces. Each of these threads has a weight suspended by it, so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads, still stretched straight by the weights in every position they may take; so that the forms and natures of the surface which they constitute are continually changing, while they always remain ruled surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid, etc.

These models were invented by the late Theodore Olivier while Professor of Descriptive Geometry at the Conservatoire des Arts et Métiers, in Paris. One set of them is now deposited there, and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands, and, after his death, in 1853, retained by his widow till bought of her by Professor Gillespie, in 1855. It is more complete than that in the Paris Conservatoire. It may be worth noticing that the silver plates on the boxes, reading "*Inventé par*

*Theodore Olivier,"* etc., were added by Madame Olivier, at her own expense, after the purchase, as a tribute to the memory of her husband, her own words being, "*Je tenais à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité.*"

Professor Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones, etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal; models illustrating Shades and Shadows.

**Stone Cutting Models** (twenty) in plaster, selected from those of L'École Polytechnique of Paris.

Professor Bardin's models (ten) in plaster, of OBLIQUE ARCHES.

Groined and cloistered arch models (ten) in wood and plaster.

Models of structures in stone, consisting of bridges, culverts, etc.

Winding-stair models in wood and plaster. Full sized models of voussoirs and skew-backs of an oblique arch.

**Models in Topography.** French and German plaster models, giving all the different forms of ground, accompanied by topographical drawings, showing how to represent these forms by contour lines; hatchings and shades from vertical and oblique light; models and maps in colored topography; a large model of Mount Cenis Pass, showing the wagon road and contour lines.

**Architectural Models.** Models of the five orders of Architecture from L'École des Beaux Arts, Paris; portals; stairs; roofs; walls; buttresses; domes, etc.

**Engineering Models.** Schroeder's models of joints, brick bonds, etc.; spur wheels; bevel wheels; cranes; pile drivers; various forms of water-wheels; pumps; cylinders; valves; eccentrics; etc.; steam engines.



Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full sized model of the liquid vein measured by Poncelet and Lesbros.

Models of bridges of various systems, comprising truss, suspension, tubular and arch bridges; Doyne's Dynamometer Bridge Models showing, by means of dynamometer, strains at different points; models of roof trusses, arranged for using the dynamometer to show the different stresses.

Models of fortifications, illustrating Vauban's system; shot, shell, etc.

Models of culverts, piers, abutments, culvert heads, wing walls, rail sections, etc.

**Maps, Drawings, Etc.** This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections; about fifty thousand engravings, lithographs, photographs and detail drawings of engineering and architectural structures; working drawings of machines, bridges, buildings, etc.

**Physical Apparatus.** To illustrate the lectures in Physics, the college has an extensive collection of apparatus. This has been secured largely from foreign makers and includes special pieces of apparatus constructed under the direction of the late Prof. Foster, besides sets of apparatus of standard patterns by Koenig, Duboscq, Ruhmkorff, and others.

**In Mineralogy.** The Wheatley collection contains nearly 4,000 specimens of minerals, the result of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are, without exception, open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy. Among the rare and valuable specimens are those of Anglesite, Cerussite, Mimetite and Calcoprite, which in American specimens are equaled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few

known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blow-pipe examination.

**In Metallurgy.** The College possesses a suite of ores of the useful metals, comprising over 1,000 specimens. These have been arranged to illustrate their mode of occurrence and geographical distribution. In addition are the fluxes, fuels, etc., used in obtaining the metals from the ores, together with the slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces, etc.; also suites of specimens of wood, charcoal, mineral coal, peat, etc., for physical inspection; also specimens of most of the useful alloys.

**In Chemistry.** The chemical laboratory is furnished with tile-top desks and lockers, and all the modern apparatus necessary for work in general chemistry and qualitative and quantitative analysis. Ample hoods occupy one side of the laboratory, where the student may work with the disagreeable and poisonous gases. In the private laboratory of the professor of chemistry provision is made for any students who may desire to pursue advanced courses, either in volumetric analysis, water and milk analysis, organic chemistry, or any special work in connection with courses of other departments.

A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids; the crude products themselves and the materials used in the manufacture of the alkalis, soaps, matches, black lead, candles, petroleum products; linseed, olive, castor, cottonseed and other oils; paper, porcelain, glass, fire and building brick, mortar and cements, beet and cane sugars, white lead and other paints, etc., etc., form a part of the permanent collections of the department.



## SANITARY ENGINEERING DEPARTMENT

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**General Considerations.** The extensive development of sanitary biology during recent years and the establishment on a firm, scientific basis of the germ-theory of disease have laid a secure foundation for the important specialty of sanitary engineering. Already the practical application of the principles in many lines of public utility, as well as in medicine and surgery, has resulted in a very marked decrease in the annual death rate. The most fruitful line of application of this recent and useful knowledge lies in the intelligent design, construction and operation of municipal public works and of systems of water supply, sewerage and drainage, heating and ventilation of private residences, schools, hotels, hospitals and other public institutions and buildings.

**General Scheme of the Course.** The course in sanitary engineering differs from the general engineering course by omitting the astronomical surveying, geodesy and railroad construction, and substituting therefor sanitary biology heating and ventilation, house drainage and plumbing, sewage disposal, sanitary codes and laws, and an increase in the amount of chemistry and chemical laboratory work.

**Sanitary Conditions of Buildings.** In the first and third term Senior, respectively, are given courses in heating and ventilation and in house drainage and plumbing. The latter course will give special attention to the matter of water supply and of the removal of wastes from buildings in all situations, from the isolated country house to that in a thoroughly drained city.

**Sewerage and Drainage.** The study of the principles and practice of sewerage and sewage disposal is given during the last term of the Senior year. The fundamental sanitary and constructive principles will be developed and a comparative study of the various systems as well as of the details of

construction and maintenance receives careful attention. A course of lectures in the third term Senior presents the principles upon which the laws touching the subject of the public health are based and the outlying principles which should govern the preparation of sanitary codes and regulations.

For special information regarding the Departments of General and Sanitary Engineering address

OLIN H. LANDRETH,

Professor of Engineering, Schenectady, N. Y.

## **ELECTRICAL ENGINEERING DEPARTMENT**

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A course of instruction in Electrical Engineering was introduced in 1895, and in 1902 was re-organized and made into a separate department of the engineering school under the direction of Professor Charles P. Steinmetz, consulting engineer of the General Electric Company.

The course of studies offered by the Department of Electrical Engineering aims at a thorough and broad scientific education of the prospective engineer, rather than the specific training of a specialist. The instruction, therefore, consists of three classes of studies. The general culture studies furnish such training as is now considered essential for every educated man, as languages, literature, history, etc. Such instruction extends over a large part of the first two years, and is then followed by a broad and general technical education, giving the student the fundamental principles and their application to all branches of engineering. Ultimately follows the specific instruction in Electrical Engineering, which, while it enables the student, after graduation, to enter the field of Electrical Engineering practice in the manufacturing or operating company or consulting engineer's office in a subordinate capacity only, has given him all the necessary requirements to gather in a few years' practice the knowledge needed for independent work of greater magnitude.

The instruction especially aims at a thorough understand-

ing of the fundamental principles rather than a memorizing of numerous facts—that is, aims at quality, and not quantity—and as far as possible in all engineering instruction the subject is brought before the students in three different ways: by a theoretical lecture course with recitations, practical instruction in the electrical laboratory paralleling the lecture course, and, following after this, the application of the knowledge gained in lecture courses and laboratory to calculation and design in the drafting room. Finally, more independent work on the solution of engineering problems is undertaken by the students. These problems invariably require some research work; the systematic tabulation of the results with original conclusions constitute the graduating thesis. Throughout the technical course, by work in the laboratory, some familiarity with the apparatus is given to the students before the technical side is taken up in the lecture course, so that when approaching the theoretical studies of electrical phenomena or apparatus the student is already able to appreciate the practical value and importance of the subject with which the theoretical investigations deal.

Through the active interest which the General Electric Company takes in technical education, an arrangement has been effected between the College authorities and the officials of the company by which the students in the Junior and Senior classes are admitted to the company's works at regular scheduled times, under the direction of their instructor, with the privilege and opportunity of studying and inspecting the plant and operations and of being regularly instructed therein. The work has been systematically arranged, and is given simultaneously with the corresponding class and laboratory work, to which it forms an important and valuable adjunct.

The active interest taken by the prominent engineers of the General Electric Company has made it possible to offer to the Junior and Senior classes a systematic lecture course on the different branches of Electrical Engineering, in which the lecture on each topic is delivered by the specialist who is the highest authority in this branch of Electrical Engineering.

**List of Studies—Outline Description**

The following list of studies comprises only those subjects of the electrical engineering course which are not required in the other courses, and have, therefore, not yet been described in detail. All the culture studies and most of the general engineering and -scientific studies are pursued in common with the students of other engineering branches. Beginning with the Junior year, however, the courses diverge. The electrical engineers take up a number of mechanical engineering subjects and continue them throughout the Junior and first part of the Senior year. In fact, during the Junior year the mechanical engineering work may be considered as constituting the major subject, though a considerable amount of time is also devoted to electrical engineering.

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The mechanical engineering subjects not previously described are:

**Hydraulics and Hydraulic Design.**

**Hydraulic Turbine.**

**Theory of the Steam Engine.**

**Steam Engine Design.**

**Thermodynamics, Gas Engine and Steam Turbine.**

Other general subjects given only to electrical engineering students are:

**Elements of Civil Engineering.** The work and methods of the civil engineer. This course is given to broaden the ideas of the student, thus enabling the electrical engineer to value properly the labors of his colleague in this allied department of the profession.

**Engineering Mathematics.** One lecture a week is given throughout the Junior year on the special branches of mathematics most employed in engineering work. It is recognized that mathematics is the foundation of all engineering, and a considerable part of the Freshman and Sophomore years is therefore devoted to the study of mathematics. In addition thereto this course is given specially to train the students in those particular branches of mathematics which are most frequently applied in electrical engineering, and so enable them to handle mathematics as a ready working tool in practical engineering problems. This course is given by Prof. Steinmetz, and in 1905-1906 covered the infinite series, its derivation and meaning; the trigonometric series; determination of maxima and minima; the fundamental differential equation of electrical engineering and its integral; empirical curves and their investigation, as the parabolic, exponential and logarithmic function.

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The electrical engineering studies include the following:

**Sophomore Electrical Laboratory.** The profession of electrical engineering requires men who, besides possessing the broad fundamental knowledge which must form the basis of every engineering work, are thoroughly familiar with the operation, characteristics, underlying principles, design and calculation of the various machines and appliances used in electrical work. The multiplicity of the applications of electrical energy at present is such that in order to cover the ground in the short time afforded by a four years' course special effort must be made to present the matter in such form and manner as to secure to the student the greatest economy of time and energy.

To this end the student is made acquainted in his Sophomore year with the operation and general behavior of electrical machinery, so that when in the Junior year the exact theoretical and laboratory investigation of electrical apparatus is undertaken he may already have some knowledge of the nature, general features, purpose, etc., of his studies.



This preliminary work, which has been found to increase greatly the efficiency of the work done in the Junior year, consists in the handling and running of motors and generators, both direct and alternating current; the use of transformers; the study of arc lights of various constructions and systems and in general practice in the use of meters and measuring instruments. The practical construction of the machinery is also considered, and at regular intervals trips are made to the foundry, pattern shops, erecting shops and machine shops of the General Electric Company and of the American Locomotive Works.

**Direct Current Circuits and Apparatus.** After completing the electrical laboratory work of the Sophomore year students in electrical engineering devote a considerable part of the Junior year to the study of the fundamental principles of the subject. Direct current phenomena are studied first, as this part of the subject is somewhat simpler and is readily brought within the grasp of the average student. This work includes the theory and practice of direct current generators and motors and auxiliary apparatus, taking into account also the principles of design.

**Direct Current Laboratory.** The work under this head is parallel with the foregoing, and includes all standard tests of direct current machines, and is supplemented by numerous experiments arranged with due regard to their general importance and scientific value. The machines with which the student has become more or less familiar during his Sophomore year are now examined in detail and careful records made of efficiency, regulation, internal characteristics, commutation under varying loads, etc.

**Direct Current Design.** When the foregoing courses have been finished each student is directed to design a specified machine and is required to do this work in class and without other aid than that given by the instructor. Complete calcula-

tions, with curves, where necessary, and full working drawings of the machine designed, are required, and credit is given for accuracy, originality and neatness.

**Alternating Current Circuits and Apparatus.** The importance of alternating currents in modern electrical engineering and the complex nature of their phenomena make it essential that a large amount of time be spent in the study of alternating current circuits and apparatus. This work is taken up in the second term of Junior year immediately after the completion of direct current theory and in conjunction with direct current design and is continued throughout the Junior and during a part of the Senior year. The work included under this head covers the more elementary part of the subject and is made practical by the assignment of a large number of problems to be worked out by the student. It is carried on at the same time with the following course.

**Alternating Current Laboratory.** The work done here in the Junior year consists of an extensive series of experiments corroborating and explaining the theories of the lecture room. The exercises consist in investigation of voltage and current conditions on a variety of combinations of resistance, inductance and capacity in series and in multiple, the exploring of field flux and wave shapes of alternators, and the effect of inductance and capacity on wave shape. Upon entering the Senior year the student is thus equipped with the broad foundation in the underlying principles of electrical engineering, which is absolutely essential to a comprehensive study of the more intricate and special departments of the subject.

**Modern Theory of Electrical Engineering.** Here the subject of alternating current phenomena is continued throughout the Senior year. The method of treatment developed by Professor Charles P. Steinmetz is used entirely, and is applied to the different apparatus, as transformers, induction



motors, phase and frequency converters and other induction apparatus; alternators, synchronous motors, rotary converters and other synchronous apparatus, etc., which are thoroughly discussed with reference to theory, practical design and operation under varying conditions.

**Alternating Current Laboratory.** In this course, which is parallel with the foregoing, complete tests are made on the apparatus studied, and the characteristics of the various machines are determined. The laboratory work deals with the transformer: ratio, impedance and coreloss characteristic, regulation and heat runs, the synchronous motor and generator: amplitude and phase displacement of the various phases of multiphase machines, no load and load saturation, phase characteristics, pulsation, regulation and compounding curves, starting test, etc., the induction motor: determination and plotting of curves for power factor, speed, slip, torque, efficiency as function of speed, starting tests on motors with squirrel cage armatures and compensator, also on machines with variable rotor resistance, impedance and coreloss curves and maximum output determination, the single phase induction motor, etc.

**Alternating Current Machine Design.** This subject is a continuation throughout the Senior year of the Machine Design begun during the Junior year, and the two are handled in much the same manner. Transformers, induction motors, alternating current generators, etc., are calculated and their layouts completed. As each type of machine is taken up, fundamental lectures are first given, outlining the requirements for successful construction and operation and supplying data for all computations. Individual work is then assigned to each student and is carried out under the personal supervision of the instructor.

The foregoing courses cover the general theory of electrical phenomena and machinery. The application of this knowledge to the various fields of electrical engineering work is taken up in the following courses.

**Electric Lighting.** This covers methods of using electricity in the production of light, systems of distribution, their comparative economy and efficiency, central station layout and equipment, switchboard design, electricity meters, lightning protection, standard wiring, indoors and out-of-doors.

**Electric Transmission.** The subjects discussed here are long distance transmission, line construction, systems, grouping of machines, control of phase, methods of compensation, maximum power supplied over line, line efficiency, copper efficiency, distributed capacity, inductance, resistance, leakage and natural period of transmission line, surging, resonance due to higher harmonics, balanced and unbalanced polyphase systems, transformations.

A part of this course, dealing with the more intricate problems, is given by Prof. Steinmetz personally.

**Electric Railways.** The subject of electric railway engineering is treated in three sections: 1. From the point of view of the consulting engineer who, being retained by the promoters of a proposed railway, investigates the field and territory of the new line, advises as to probable earnings of line, lays out route, prepares plans and specifications and has charge of construction. 2. From the point of view of the operating engineers who have charge of rolling stock and maintenance of service on the line. This includes a complete discussion of the equipment of modern electric railways, the various systems in vogue, sub-station equipment and in general the operation of electric railways. 3. The problem of the electric railway as it is presented to the designing electrical engineer is discussed. About half of the time devoted to railways is reserved for this section of the work. The questions of predetermination of railway motors from service characteristics, of train resistance and other quantities affecting the operation of electric trains are treated and the various alternating current railway motors which are being developed are discussed. The experimental railroad operated by the General Electric Company in Schenectady is a valuable auxiliary in this course.

**Electrochemistry.** This course has been given every second year to both Juniors and Seniors, under the direction of the Electro-chemical Research Laboratory of the General Electric Company. It includes the theory of solutions, osmotic pressure, dissociation, concentrations and an outline of the principles underlying the many electrochemical processes of commerce.

An effort is now being made, however, to arrange for this course, by co-operation with the Department of Chemistry, so that it may be offered each year. Provision for laboratory practice is also under consideration.

**Scientific Literature and Technical Periodicals.** For the engineer ordinarily to neglect technical literature of the day is to live in the past. In this course, students are required to report in class upon certain English, German, French or American publications assigned to them, reviewing briefly the best articles found in current numbers. There are also included library references to biographical sketches and research works of eminent men.

It is intended by this means that the student shall become broadly familiar with the sources of the best and the most recent technical literature; that he shall learn how to keep abreast of the times; that he shall acquaint himself with channels through which he may obtain information upon any particular subject; that he shall be able to summarize any article he reads, picking out its salient points; that he shall receive practice in expressing his thoughts clearly and concisely upon important subjects.

**Lectures by Engineers.** Lectures by eminent specialists are secured at short intervals throughout the year. For 1906-1907, special arrangements have been made whereby members of the Junior and Senior classes are permitted, upon the payment of a nominal fee, to attend all meetings of the Local Branch of the American Institute of Electrical Engineers. The course of lectures thus opened to the student is a most valuable one, besides which, the privilege is obtained

of hearing interesting discussions of papers and articles which are delivered before the national body.

Among those who have consented to speak in this lecture course are:

DR. C. P. STEINMETZ.	E. E. GILBERT.
DR. E. W. RICE, JR.	W. I. SLICHTER.
PROF. ELIHU THOMSON.	C. D. HASKINS.
T. C. MARTIN.	S. A. MOSS.
W. B. POTTER.	RICHARD RICE.
W. S. MOODY.	W. S. ANDREWS.
W. L. R. EMMETT.	C. S. BRADLEY.
E. M. HEWLETT.	H. W. HILLMAN.
P. T. HANSCOM.	H. E. SUMMERHAYES.
E. J. BERG.	F. H. NEWELL.
E. H. ANDERSON.	H. G. STOTT.
C. W. STONE.	W. S. BARSTOW.
S. T. DODD.	H. W. BUCK.
H. G. REIST.	F. O. BLACKWELL.
H. F. T. ERBEN.	E. A. ACHESON.
J. B. TAYLOR.	W. M. WHITE.
A. H. ARMSTRONG.	S. D. SPRONG.

### **Electrical Laboratory Equipment**

The new Electrical Engineering Laboratory is now in use. It is a commodious, well lighted building, and permits the arrangement and grouping of our machines in a flexible relation to each other.

The ground plan of the building is T-shaped. The upper bar of the T has two stories. The lower floor is devoted to three laboratory rooms, the largest of which is 101 ft. by 35 ft. outside dimensions. This is the main laboratory and extends from front to rear of the building.

A light well-ventilated drafting room occupies the major portion of the second floor, being 73 ft. by 27 ft. in dimensions.

The purpose of a college laboratory of Electrical Engi-

neering is two-fold: To familiarize the student with the shape, appearance, relative proportions and construction of modern electrical apparatus, and to instruct him in the handling, assembling, testing and operation of electrical apparatus under normal and abnormal conditions.

Because of the great variety and large size of modern electrical apparatus, the former purpose can be fulfilled very incompletely only, even in the largest and best equipped college laboratories. Through the favorable disposition of the General Electric Company, by giving the Electrical Engineering students of Union College free access to the works and testing rooms, this purpose is admirably fulfilled here, and by frequent and regular inspection trips to the Works and Testing Department of the General Electric Company under the direction of the college instructors, which trips constitute an integral part of the laboratory instruction, the students gain a very intimate knowledge of modern electrical apparatus of all types and sizes, not only when assembled and in operation and test, but also during their construction in the shops.

In equipping the college laboratory special consideration was therefore given to the selection only of such representative types of apparatus as can be handled, operated and tested by the students, and of a size sufficiently large to correspond to modern practice, but not so large as to make the operation under abnormal conditions—that is, under conditions which as a rule are specially instructive—unsafe for the apparatus. Entirely excluded from the laboratory equipment was all such machinery as the students could not be permitted to handle freely.

Three sources of power are provided: A direct connected unit, consisting of a Westinghouse gas engine and a Westinghouse direct current generator; connection with the 500-volt trolley circuit of the Schenectady Railway Company, and connection with the primary three phase distributing mains of the 2,300-volt alternating current city circuit. In the latter case the voltage is reduced by banks of step-down transformers, so that the students can handle the safe low tension circuits only.



A secondary supply is also secured by means of a group of lead plate storage batteries charged by a mercury arc rectifier upon the alternating current power circuit.

A very large number of various sizes of transformers are provided to give the students practical experience in connecting transformers for different ratios and for transformation between three-phase, quarter-phase, six-phase, etc., systems. The equipment further contains three-phase, quarter-phase and six-phase alternators and synchronous motors, the two characteristic types of induction motors, three and six-phase rotary converters, and numerous smaller induction motors, converters and direct current motors and generators of different types. A constant current arc machine, with different types of arc lamps and a constant alternating current transformer, with series arc lamps, a storage battery, testing tables, switchboards and numerous instruments of the indicating and the integrating type, are also provided for efficient instruction.

Power is distributed from a central switchboard to the various boards in the Department, to the mechanical workshop provided for the students, and to the general lighting circuit of the building. Further additions to the laboratory are under contemplation.

### **Graduate Course—One Year**

#### **Leading to the Degree of M. E. E.**

To those students who, after graduating from the four-year Electrical Engineering course, desire to increase their knowledge a Graduate Course is offered in which, besides instruction in higher branches of Electrical Engineering, there will be occasion to carry out original investigations under the supervision and with the assistance of specialists prominent in Electrical Engineering practice on subjects closely connected with the most recent advance of Electrical Engineering. In return for the assistance offered to the Graduate students in their research work by prominent specialists the Graduate students will be required to devote a small

part of their time to assisting the regular University instructors in laboratory instruction. This course leads to the degree of Master of Electrical Engineering, and is open to graduates of Union College or of other institutions approved by the Faculty.

Some of the courses offered to the graduate students are:

Advanced Calculus,  
Differential Equations,  
Long Distance Transmission,  
Design and Control of Electric Power Systems of Very  
Great Magnitude,  
Electric Railway and Traction, continued,  
Modern Theory of Electrical Engineering, continued,  
Oscillating Currents and High Frequency Phenomena,  
Lightning and Lightning Protection,  
Wave Transmission, with Special Application to Tele-  
phony,  
Scientific Foundations of Electrical Engineering,  
Electro-Chemistry,  
Chemistry of Very High Temperature,  
Laboratory,  
Research Work.

Some of the lectures given by Professor Charles P. Steinmetz for Graduates are as follows:

Review: The Electric, Magnetic and Dielectric Circuit. Resistance, Inductance, Capacity and Wireless Telegraphy.

The Law of Electromagnetic Induction; Electric Apparatus and Machines.



The Characteristic Curves of Electrical Apparatus, Machines and Circuits, Magnetic Characteristic: Saturation and Excitation Curve. Load Characteristic: Regulation Curve, Field Characteristic, Compounding Curve. Phase Characteristic of Alternating Current Apparatus; Efficiency, No Load and Load Losses.

Commutating Machines: Direct Current Generators and Motors.

Synchronous Machines: Alternators and Synchronous Motors and Converters.

Induction Machines: Induction Motors and Generators, Single Phase and Polyphase Repulsion Motors and Generators.

Rectifying Machines: The Arc Machine, Constant Potential and Constant Current Rectification.

Transformers and Reactors: Constant Potential and Constant Current.

Meters: Indicating, Integrating and Recording.

Transient Phenomena: Starting and Building Up of Direct Current Generators; Effect of Field Inductance and Fluctuating Load. Starting of Synchronous Machines.

Starting of Transformers, of Inductive Circuits, of Circuits containing Inductance and Capacity, Transmission Lines. Short Circuit Phenomena of Circuits containing Inductance and Capacity. Transmission Lines, Short Circuit Oscillations.

Short Circuit Current of Direct and Alternating Current Generators.

Hunting or Surging of Synchronous Machines, Motors and Converters. Hunting or Surging of Induction Machines, of Direct Current Motors and Generators.

In addition hereto, a course is given on the design of electrical apparatus, in which the students carry out the design of a number of typical machines and apparatus under the personal direction of Prof. Steinmetz; and the course includes the discussion of all the elements entering into the practical design and construction.

For special information regarding the Department of Electrical Engineering, address

CHARLES P. STEINMETZ,  
Professor of Electrical Engineering,  
Schenectady, N. Y.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**GENERAL ENGINEERING**

	First Term	Second Term	Third Term
<b>Freshman Year<sup>2</sup></b>	3 French <sup>3</sup> 3 German 2 Rhetoric 3 Freehand Drawing 4 Algebra 1 Physiology  Lectures	3 French <sup>3</sup> 3 German 2 Rhetoric  4 Analytic Ge- ometry 2 Mensuration 3 Mechanical Drawing 1 Gymnastics  Lectures	3 French <sup>3</sup> 3 German 2 Rhetoric 3 Calculus 2 Analytic Ge- ometry 2 Surveying and Plotting 1 Trigonometry Summer Vaca- tion Work 1 Physiology
<b>Sophomore Year<sup>2</sup></b>	3 German <sup>4</sup> 1 Rhetoric 3 Calculus 3 Mechanics 3 Physics 3 Chemistry 3 English Liter- ature 2 Surveying and Plotting 1 Hygiene	3 German <sup>4</sup> 1 Rhetoric 3 Calculus 2 Mechanics 4 Physics 3 Chemistry 2 English Liter- ature 3 Descriptive Geometry 1 Electrical Laboratory	3 German <sup>4</sup> 1 Rhetoric 2 Calculus 1 Mechanics 4 Physics 5 Chemistry 3 Topographical Surveying 3 Descriptive Geometry; Shades and Shadows 1 Electrical Laboratory Summer Vaca- tion Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Identical in General, Sanitary and Electrical Engineering courses.

<sup>3</sup>Those who passed French at entrance take Chemistry instead.

<sup>4</sup>Taken in place of Chemistry by those who passed French at entrance.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**GENERAL ENGINEERING, OPTION A**

	First Term	Second Term	Third Term
<b>Junior Year<sup>2</sup></b>	1 Rhetoric 2 American History 4 Applied Mechanics 3 Chemical Laboratory 3 Highways and Pavements 5 Topographical Surveying	1 Rhetoric 2 American History 5 Mechanics of Materials and Eng. Laboratory 3 Kinematics Machine Drawing 3 Electricity 2 Thermodynamics 1 Natural Perspective	1 Rhetoric 2 American History 4 Stresses in Structures and Graph. Analysis 3 Hydraulics 3 Route Surveying 3 Spher. Trigonometry and Astronomy 2 Stereotomy Inspection Trips Summer Vacation Work
<b>Senior Year</b>	3 Economics 5 Railroad and Trolley Road Construction 4 Engineering Stresses 2 Economic Geology 2 Motors and Motive Power 2 Outlines of Architecture One Literary Essay One Tech. Essay Inspection Trips	3 Sanitary Biology 3 Method of Least Squares 4 Engineering Design and Construction 2 Water Supply Engineering 3 Motors and Motive Power 2 Building Construction One Literary Essay One Tech. Essay	3 Engineering Law and Procedure 3 Geodesy and Field Astronomy 5 Engineering Design and Construction 5 Water Supply, Sewerage and Sewage Disposal Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>The Junior Year is identical in General and Sanitary Engineering courses.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**GENERAL ENGINEERING, OPTION B**

	First Term	Second Term	Third Term
<b>Junior Year</b>	1 Rhetoric 2 American History 2 English History 1 Elements of Law 4 Applied Mechanics 3 Highways and Pavements 3 Chemical Laboratory 2 Topographical Surveying	1 Rhetoric 2 American History 2 English History 2 Elements of Law 5 Mechanics of Materials and Eng. Laboratory 3 Electrical Machinery 2 Thermodynamics	1 Rhetoric 2 American History 2 French History 3 Law of Property and Contracts 4 Stresses in Structures and Graph. Analysis 3 Route Surveying 3 Hydraulics Inspection Trips Summer Vacation Work
<b>Senior Year</b>	3 Economics 2 Political Science 3 Principles and Law of Corporations 2 Motors and Motive Power 4 Engineering Stresses 2 Outlines of Architecture 2 Economic Geology One Literary Essay One Tech. Essay Inspection Trips	3 Sociology 2 Political Science 2 Principles of Finance and Financial Operations 3 Motors and Motive Power 4 Engineering Design and Construction 2 Water Supply Engineering 2 Building Construction One Literary Essay One Tech. Essay	3 Sociology 2 International Law 3 Principles of Administration 5 Engineering Design and Construction 3 Principles of Accounting Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**SANITARY ENGINEERING**

[The Freshman, Sophomore and Junior years of this course are identical with those years in the General Engineering Course following Option A.]

**SENIOR YEAR**

First Term	Second Term	Third Term
2 Motors and Motive Power	3 Motors and Motive Power	3 Engineering Law and Procedure
4 Engineering Stresses	4 Engineering Design and Construction	5 Engineering Design and Construction
3 Heating and Ventilation	2 Water Supply Engineering	5 Sewerage and Sewage Disposal
3 Chemical Laboratory	2 Chemical Laboratory	1 House Draining and Plumbing
2 Economic Geology	3 Sanitary Biology	1 Sanitary Codes and Laws
3 Economics	3 Electives <sup>2</sup>	2 Electives <sup>2</sup>
One Literary Essay	One Literary Essay	Thesis
One Tech. Essay	One Tech. Essay	
Inspection Trips	Inspection Trips	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see page 116.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## ELECTRICAL ENGINEERING

For the general plan of course, see page 165.

Freshman and Sophomore Years as in General Course, page 180.

## JUNIOR YEAR

First Term	Second Term	Third Term
1 Rhetoric 2 American History 2 Direct Current Laboratory 1 Mathematics 2 Direct Current Circuit and Apparatus 3 Hydraulics and Hydraulic Design 4 Applied Mechanics  3 Analytic Chemistry Lecture Course by Specialists <sup>2</sup> Inspection Trips	1 Rhetoric 2 American History 2 Electrical Laboratory 1 Mathematics 2 Direct Current Circuit and Apparatus 2 Hydraulic Turbine 4 Theory of Steam Engine 2 Altern. Cur. Circuit and Apparatus 2 Electrochemistry Lecture Course by Specialists <sup>2</sup> 1 Natural Perspective	1 Rhetoric 2 American History 2 Electrical Laboratory 1 Mathematics 2 Elect. Apparatus Design 2 Elements of Civil Engineering 4 Steam Engine Design 2 Altern. Cur. Circuit and Apparatus 2 Electric Lighting Lecture Course by Specialists <sup>2</sup> Inspection Trips Summer Vacation Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>See page 173.



**CURRICULUM OF THE B. E. COURSE<sup>1</sup>**  
**ELECTRICAL ENGINEERING**

For the general plan of the course, see page 165.

Freshman and Sophomore Years as in General Course, page 180.

**SENIOR YEAR**

First Term	Second Term	Third Term
3 Economics 2 Mod. Theory of Electrical Engineering 3 Transmission and Distribution 2 Elec. Apparatus Design 1 Tech. French or German 3 Thermodynamics, Gas Engines and Steam Turbine 2 Altern. Cur. Circuit and Apparatus 2 Electrical Laboratory One Literary Essay One Technical Essay Lecture Course by Specialists <sup>2</sup> Inspection Trips	2 Electro-chemistry 3 Mod. Theory of Electrical Engineering 3 Transmission and Distribution 3 Elect. Apparatus Design 1 Tech. French or German 2 Electric Railway 2 Altern. Cur. Circuit and Apparatus 2 Electrical Laboratory One Literary Essay One Technical Essay Lecture Course by Specialists <sup>2</sup>	3 Engineering Law and Procedure 3 Mod. Theory of Electrical Engineering 3 Transmission and Distribution 3 Elect. Apparatus Design 1 Tech. French or German 2 Electric Railway Thesis  Lecture Course by Specialists <sup>2</sup> Inspection Trips

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>See page 173.

## First Year

## Second Year

CURRICULUM OF THE SIX YEARS' B. E.-PH. B. COURSE<sup>1</sup>

## GENERAL ENGINEERING

Entrance requirements to be the same as for present Engineering Course and Latin-Scientific Course

First Term	Second Term	Third Term
4 <i>Fr</i> Latin 3 <i>Fr</i> French or German <sup>2</sup> <i>ls &amp; e</i> 2 <i>Fr</i> Rhetoric <i>ls &amp; e</i> 4 <i>Fr</i> Algebra <i>e</i> 3 <i>Fr</i> Free Hand Drawing 1 <i>Fr</i> Physiology Lectures	4 <i>Fr</i> Latin 3 <i>Fr</i> French or German <sup>2</sup> <i>ls &amp; e</i> 2 <i>Fr</i> Rhetoric <i>ls &amp; e</i> 4 <i>Fr</i> Anal. Geom. <i>e</i> 2 <i>Fr</i> Mensuration <i>e</i> 1 <i>Fr</i> Physiology <i>ls</i> 1 <i>Fr</i> Gymnasium Lectures	4 <i>Fr</i> Latin <i>ls</i> 3 <i>Fr</i> French or German <sup>2</sup> <i>ls &amp; e</i> 2 <i>Fr</i> Rhetoric <i>ls &amp; e</i> 2 <i>Fr</i> Anal. Geom. <i>e</i> 3 <i>Fr</i> Calculus <i>e</i> 1 <i>Fr</i> Physiology <i>ls &amp; e</i> 2 <i>Fr</i> Surveying <i>e</i> Summer Vacation Work
3 <i>So</i> Latin 3 <i>Fr</i> German or French <sup>2</sup> <i>ls &amp; e</i> 2 <i>So</i> English & Rhet. <i>ls</i> 3 <i>So</i> Calculus <i>e</i> 2 <i>So</i> Surveying <i>e</i> 3 <i>So</i> Chemistry <i>ls &amp; e</i> 1 <i>So</i> Hygiene <i>ls &amp; e</i>	3 <i>So</i> Latin <i>ls</i> 3 <i>Fr</i> German or French <sup>2</sup> <i>ls &amp; e</i> 3 <i>So</i> English & Rhet. <i>ls</i> 3 <i>So</i> Calculus <i>e</i> 3 <i>So</i> Chemistry <i>ls &amp; e</i> 3 <i>Fr</i> Mechanical Drawing <i>e</i>	3 <i>So</i> Latin <i>ls</i> 3 <i>Fr</i> German or French <sup>2</sup> <i>ls &amp; e</i> 3 <i>So</i> English & Rhet. <i>ls</i> 2 <i>So</i> Calculus <i>e</i> 5 <i>So</i> Chemistry <i>e</i> 1 <i>Fr</i> Trigonometry <i>e</i> Summer Vacation Work

First Year

Second Year

Third Year			Fourth Year		
First Term	Second Term	Third Term	First Term	Second Term	Third Term
3 <i>So</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i> 3 <i>So</i> Physics <i>e</i> 3 <i>Jr</i> English & Rhet. <i>ls</i> 3 <i>Jr</i> Chem. Lab'y <i>e</i> 2 <i>So</i> English Hist. <i>ls</i> 3 <i>So</i> Mechanics <i>e</i>	3 <i>So</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i> 4 <i>So</i> Physics <i>e</i> 3 <i>Jr</i> English & Rhet. <i>ls</i> 3 <i>So</i> Descrip. Geom. <i>e</i> 2 <i>So</i> English Hist. <i>ls</i> 2 <i>So</i> Mechanics <i>e</i>	3 <i>So</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i> 4 <i>So</i> Physics <i>e</i> 3 <i>Jr</i> English & Rhet. <i>ls</i> 3 <i>So</i> Descrip. Geom. <i>e</i> 2 <i>So</i> French Hist. <i>ls</i> 1 <i>So</i> Mechanics <i>e</i> 3 <i>So</i> Topog. Surv. <i>e</i> Summer Vacation Work	4 <i>Jr</i> App. Mechanics <i>e</i> 5 <i>Jr</i> Topog. Surv. <i>e</i> 3 <i>Jr</i> Logic <i>ls</i> 3 <i>EJr</i> American Hist. <sup>3</sup> <i>ls</i> 3 <i>Jr</i> Biology <i>ls</i>	5 <i>Jr</i> Mechs. of Mat. and Eng. Lab'y <i>e</i> 2 <i>Jr</i> Thermodyn's <i>e</i> 3 <i>Jr</i> Psychology <i>ls</i> 3 <i>EJr</i> American Hist. <i>ls</i> 3 <i>Jr</i> Biology <i>ls</i> 1 <i>Jr</i> Nat. Perspec. <i>e</i> 1 <i>So</i> Elec. Lab'y <i>e</i>	4 <i>Jr</i> Stresses <i>e</i> 3 <i>Jr</i> Hydraulics <i>e</i> 3 <i>Jr</i> Ethics <i>ls</i> 3 <i>EJr</i> American Hist. <i>ls</i> 3 <i>Jr</i> Biology <i>ls</i> 1 <i>So</i> Elec. Lab'y <i>e</i> Summer Vacation Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. *Fr.*—Freshman work, *So.*—Sophomore work, *Jr.*—Junior work, *ls* shows that the work is taken from the regular four years' Ph. B. course; *e* that the work is taken from the regular four years' B. E. course.

<sup>2</sup>Students offering French at entrance will take French during the first year and German during the second and third years; but students offering German at entrance will take German during the first and second years and French during the third year.

<sup>3</sup>Subjects preceded by *E* are taken from the elective list, but are required in this course.

After the completion of the fourth year, students in this course are given the choice of two optional courses A and B. The details of these optional courses are here given.

### CURRICULUM OF THE SIX YEARS' B. E. - PH. B. COURSE<sup>1</sup>

#### GENERAL ENGINEERING, OPTION A

First Term			Second Term			Third Term		
Fifth Year	3 ESr European Hist. <sup>2</sup>	ls	3 ESr European Hist. <sup>2</sup>	ls	3 ESr European Hist. <sup>2</sup>	ls	3 ESr European Hist. <sup>2</sup>	ls
	2 ESr Comparative Politics <sup>3</sup>	ls	2 ESr Comparative Politics <sup>2</sup>	ls	2 ESr Internat. Law <sup>2</sup>	ls	2 ESr Internat. Law <sup>2</sup>	ls
	3 Sr Economics	ls & e	3 Sr Sociology	ls	3 Sr Sociology	ls	3 Sr Sociology	ls
	4 Sr Stresses	e	3 Sr Kinematics and Machine Draw.	e	3 Jr Route Surv.	e	3 Jr Route Surv.	e
	2 Sr Motors and Motive Power	.e	3 Sr Motors and Motive Power	e	3 Jr Spher. Trigon. and Astronomy	e	3 Jr Spher. Trigon. and Astronomy	e
Sixth Year	1 Sr Rhetoric	ls	1 Sr Rhetoric	e	1 Sr Rhetoric	ls	1 Sr Rhetoric	ls
	3 EJr Gen. Geology	ls	3 Jr Elec. Machinery	e	2 Jr Stereotomy	e	2 Jr Stereotomy	e
	6 Sr R. R. & Trolley Const'n & Econ.	e	1 Sr Eng. Design	e	Summer Vacation	Work	Summer Vacation	Work
	2 Sr Outlines of Architecture	e	2 Sr Water Supply	e	5 Sr Eng. Design	e	5 Sr Eng. Design	e
	3 Sr Principles of Aesthet. Design	e	2 Sr Build. Const'n	e	5 Sr Water Supply and Sewerage	e	5 Sr Water Supply and Sewerage	e
Sixth Year	1 Jr Elements of Law	e	2 Jr Elements of Law	e	3 Jr Law of Prop. and Contracts	e	3 Jr Law of Prop. and Contracts	e
	2 Sr Econ. Geology	e	3 Sr Least Squares	e	3 Sr Geodesy and Field Astron.	e	3 Sr Geodesy and Field Astron.	e
	3 Jr Highways and Pavements	e	3 Sr Bacteriology	e	Thesis		Thesis	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. Jr.—Junior work, Sr.—Senior work, ls. shows that the work is taken from the regular four years' B. E. course, e that the work is taken from the regular four years' Ph. B. course, e that the work is taken from the regular four years' B. E. course.

<sup>2</sup>Subjects preceded by E are taken from the elective list, but are required in this course.

# CURRICULUM OF THE SIX YEARS' B. E. - PH. B. COURSE<sup>1</sup>

## GENERAL ENGINEERING, OPTION B

First Term			Second Term			Third Term					
3	<i>ESr</i>	European Hist. <sup>2</sup>	<i>ls</i>	3	<i>ESr</i>	European Hist. <sup>2</sup>	<i>ls</i>	3	<i>ESr</i>	European Hist. <sup>2</sup>	<i>ls</i>
2	<i>ESr</i>	Comparative Politics <sup>2</sup>	<i>ls</i>	2	<i>ESr</i>	Comparative Politics <sup>2</sup>	<i>ls</i>	2	<i>ESr</i>	Internat. Law <sup>2</sup>	<i>ls</i>
3	<i>Sr</i>	Economics	<i>ls &amp; e</i>	3	<i>Sr</i>	Sociology	<i>ls</i>	3	<i>Sr</i>	Sociology	<i>ls</i>
1	<i>Sr</i>	Rhetoric	<i>ls</i>	1	<i>Sr</i>	Rhetoric	<i>ls</i>	1	<i>Sr</i>	Rhetoric	<i>ls</i>
1	<i>Jr</i>	Elements of Law	<i>e</i>	2	<i>Jr</i>	Elements of Law	<i>e</i>	3	<i>Jr</i>	Law of Prop. and Contracts	<i>e</i>
4	<i>Sr</i>	Stresses	<i>e</i>	3	<i>Jr</i>	Elec. Machinery	<i>e</i>	3	<i>Jr</i>	Route Survey	<i>e</i>
2	<i>Sr</i>	Econ. Geology	<i>e</i>	3	<i>Sr</i>	Motors and Motive Power	<i>e</i>	2	<i>Jr</i>	Stereotomy	<i>e</i>
2	<i>Sr</i>	Motors and Motive Power	<i>e</i>							Summer Vacation Work	
6	<i>Sr</i>	R. R. & Trolley Const'n & Econ.	<i>e</i>	4	<i>Sr</i>	Eng. Design	<i>e</i>	5	<i>Sr</i>	Eng. Design	<i>e</i>
3	<i>Sr</i>	Prin. of Law of Corporations	<i>e</i>	4		Eng. Projects		5	<i>Sr</i>	Water Supply and Sewerage	<i>e</i>
2	<i>Sr</i>	Outlines of Architecture	<i>e</i>	2	<i>Sr</i>	Prin. of Finance and Financial Operations	<i>e</i>	3	<i>Sr</i>	Principles of Accounting	<i>e</i>
3	<i>Sr</i>	Prin. of Aesthet. Design	<i>e</i>	2	<i>Sr</i>	Building Construction	<i>e</i>	3	<i>Sr</i>	Principles of Administration	<i>e</i>
3	<i>Jr</i>	Highways and Pavements	<i>e</i>	2	<i>Sr</i>	Water Supply	<i>e</i>			Thesis	
				3	<i>Sr</i>	Bacteriology	<i>e</i>				

Fifth Year			Sixth Year		

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. *Jr.*—Junior work, *Sr.*—Senior work. *ls* shows that the work is taken from the regular four years' Ph. B. course, *e* that the work is taken from the regular four years' B. E. course.

<sup>2</sup>Subjects preceded by *E* are taken from the elective list, but are required in this course.





ALBANY MEDICAL COLLEGE

ALBANY, N. Y.

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MEDICAL DEPARTMENT OF

UNION UNIVERSITY

---

SEVENTY-SIXTH SESSION

## ALBANY MEDICAL COLLEGE

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The Medical College building, situated on Eagle Street, Albany, is well appointed in its lecture rooms, laboratories, dissecting room and museums. The chemical laboratory is fitted with every requisite for the illustration of the lectures and the use of students, while the Bender Hygienic Laboratory furnishes unexcelled facilities for instruction in histology, pathology, bacteriology and clinical microscopy.

The location of the college is such as to afford superior advantages to the student. The hospitals and dispensaries furnish an abundant supply of material for the illustration of clinical medicine and surgery, while the museums are especially rich in anatomical and pathological preparations.

With the session of 1897-'98 a four-year course was inaugurated, and four courses are now required by law in this state. The curriculum embraces lectures by professors and lecturers; recitations conducted mainly by instructors, and practical demonstrations, clinical teaching and laboratory work, in which the professors in the different departments are assisted by clinical assistants and demonstrators.

The Albany Hospital, St. Peter's Hospital, Child's Hospital, St. Margaret's House, Albany's Hospital for Incurables, County Hospital, South End Dispensary, Eye and Ear Infirmary, Albany Orphan Asylum and dispensaries connected with each are, by the regulations of their governing boards, made available for clinical purposes to the students.

Appointments to positions on the house staffs of the Albany Hospital, and other hospitals in Albany and neighboring places, are annually made, and are competed for by the members of the graduating class.

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MAYOR OF ALBANY  
RECORDER OF ALBANY

} *Ex-Officio.*

CATALOGUES are sent with care, and graduates of the college changing their post-office address, or not receiving them, will please notify

WILLIS G. TUCKER, M. D., *Registrar,*

Albany Medical College.

Albany, N. Y.

**FACULTY**

---

ANDREW VAN VRANKEN RAYMOND, D. D., LL. D.

Chancellor of the University

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ALBERT VANDER VEER, M. D., PH. D.

Professor of Surgery

JOHN MILTON BIGELOW, M. D., PH. D.

Emeritus Professor of Materia Medica, Therapeutics and Diseases of the Throat and Nose

SAMUEL BALDWIN WARD, M. D., PH. D., DEAN

Professor of Theory and Practice of Medicine and of Hygiene

JAMES PETER BOYD, M. D.,

Professor of Obstetrics, Gynecology and Diseases of Children

WILLIS GAYLORD TUCKER, M. D., PH. D., REGISTRAR

Professor of Chemistry and Toxicology

WILLIAM HAILES, M. D.

Anthony Professor of Pathological Anatomy, Histology and Fractures and Dislocations

CYRUS STRONG MERRILL, M. D.

Professor of Ophthalmology and Otology

FREDERIC COLTON CURTIS, M. D.

Professor of Dermatology

HENRY HUN, M. D.

Professor of Diseases of the Nervous System

SAMUEL ROSEBURGH MORROW, M. D.

Professor of Practice of Surgery and of Orthopedic Surgery

HERMON CAMP GORDINIER, M. D.

Professor of Physiology

HOWARD VAN RENSSELAER, M. D.

Professor of Materia Medica and Therapeutics, and Adjunct  
Professor of Theory and Practice of Medicine.

JOSEPH DAVIS CRAIG, M. D.

Professor of Anatomy, and Curator of the Museum

WILLIS GOSS MACDONALD, M. D.

Professor of Abdominal and Clinical Surgery

RICHARD MILLS PEARCE, M. D.

Professor of Pathology and Bacteriology

---

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ANDREW MACFARLANE, M. D.

Physical Diagnosis and Medical Jurisprudence

HERMAN BENDELL, M. D.

Otology

ARTHUR GUERNSEY ROOT, M. D.

Diseases of the Throat and Nose

LEO HAENDEL NEUMAN, M. D.

Theory and Practice of Medicine and Gastro-Enteric Diseases

JESSE MONTGOMERY MOSHER, M. D.

Insanity, Neurology and Electro-Therapeutics

HARRY JUDSON LIPES, M. D.

Obstetrics

EDGAR ALBERT VANDER VEER, M. D.

Surgery

ARTHUR WELLS ELTING, M. D.

Surgery and Lecturer on Surgical Pathology

JOHN ALBERTSON SAMPSON, M. D.  
Gynecology

ARTHUR SAUTTER, M. D.  
Dermatology and Lecturer on Genito-Urinary Diseases

GEORGE EMORY LOCHNER, M. D.  
Gynecology

CLEMENT FRANK THEISEN, M. D.  
Diseases of Throat and Nose

HENRY LARNED KEITH SHAW, M. D.  
Diseases of Children

---

### **Adjunct Professors**

SPENCER LYMAN DAWES, M. D.  
Materia Medica

HOLMES CONDUCT JACKSON, Ph. D.  
Physiological Chemistry

---

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History of Medicine

CHARLES HARPER RICHARDSON, M. D.  
Surgical Technic

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Clinical Microscopy

THEODORE JAMES BRADLEY, B. S., PH. G.  
Inorganic Chemistry

CHARLES HENRY MOORE, M. D.  
Ophthalmology and Otology



HERBERT DODGE PEASE, M. D.

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Anatomy. Demonstrator of Anatomy and Assistant Curator of  
Museum

JAMES FRANCIS ROONEY, M. D.

Hygiene and Instructor in Medicine, Physiological Chemistry  
and Experimental Physiology

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Physiology

EDWARD WATERBURY BECKER, M. D.

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Theory and Practice of Medicine

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Dermatology and Genito-Urinary Diseases

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Surgical Pathology

SILAS LORENZO FILKINS, M. D.  
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Bacteriology and Pathology

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Histology and Surgery

JOSEPH ALOYSIUS LANAHAN, M. D.  
Dermatology

JOHN FLETCHER ROBINSON, M. D.  
Bacteriology and Pathology

FRANK GEORGE SCHAIBLE, M. D.  
Bacteriology and Pathology

ARTHUR FENWICK HOLDING, M. D.  
Radiography

HARRY RULISON, M. D.  
Clinical Microscopy

WILLIAM ATWOOD LARKIN, Ph. G.  
Chemistry

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JOSEPH PATRICK O'BRIEN, M. D.	MOREY CHARLES COLLIER, M. D.
ARTHUR JOSEPH BEDELL, M. D.	WILLIS NELSON SIMONS, M. D.
JOSEPH AMBROSE COX, M. D.	JOHN BREEN, M. D.
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JAMES NEWELL VANDER VEER, M. D.	

**CALENDAR, 1907-1908**

1907

Regular winter session begins.....Tuesday, September 24  
 Thanksgiving vacation begins.....Wednesday, November 27  
 Lectures resumed.....Monday, December 2  
 Christmas vacation begins.....Saturday, December 21

1908

Lectures resumed.....Friday, January 3  
 Commencement.....Tuesday, May 5

**PRELIMINARY EXAMINATION.**—The preliminary examination of medical students is under the control of the Board of Regents of the University of the State of New York. Those contemplating the study of medicine should apply to the High School Department, University State of New York, Albany, by letter or otherwise, if information concerning this examination further than that given in the catalogue of the Medical College is desired. One of the examinations will be held in Albany, September 25-28, 1907.

**MID-WINTER WRITTEN EXAMINATIONS** in all the departments are held before the Christmas vacation. A printed schedule of these examinations is furnished the class.

**Course of Instruction**

The four years' graded course required of all candidates for the degree of Doctor of Medicine embraces the following subjects:

**First Year**

1. **Anatomy**—three lectures; six hours osteology and dissection. 2. **Inorganic Chemistry**—two lectures; four hours laboratory; one recitation. 3. **Organic Chemistry**—two lectures; one recitation. 4. **Physiology and Hygiene**—three lectures; one recitation; two hours demonstrations. 5. **Histology**—five hours laboratory; one recitation. 6. **Materia Medica**—three lectures; two recitations.

**Lectures** 13; **laboratory** 9 hours; **dissection and demonstrations** 8 hours; **recitations** 6.

**Second Year**

1. **Anatomy**—three lectures; eight and a half hours dissection and demonstration; two recitations. 2. **Organic and Physiological Chemistry and Toxicology**—two lectures; two and a half hours laboratory; two recitations. 3. **Physiology**—two lectures; two and a half hours laboratory; two recitations. 4. **Therapeutics**—one lecture; one-half recitation. 5. **Theory and Practice**—two and a half lectures; one-half recitation. 6. **Surgery**—one and a half demonstrations. 7. **Bacteriology and Pathology**—seven and a half hours laboratory.

**Lectures** 12; dissections and demonstrations 8½ hours; laboratory 12 hours; recitations 6.

**Third Year**

1. **Theory and Practice**—four lectures; two recitations; one hour clinics. 2. **Clinical Microscopy**—two and a half hours laboratory. 3. **Therapeutics**—two lectures; one recitation. 4. **Electro-therapeutics**—one lecture, half the term. 5. **Obstetrics**—two lectures. 6. **Pediatrics**—one lecture; one recitation half the term. 7. **Neurology**—one lecture; one recitation half the term; one clinic. 8. **Surgery (pathology, operative, fractures, dislocations)**—five lectures; two and a half hours laboratory; two recitations; three hours clinics. 9. **Physical Diagnosis and Ophthalmology**—section work, two hours. 10. **Medical Jurisprudence**—one lecture half the term. 11. **X-Rays**—one demonstration half the term. 12. **Obstetrical Histology and Pathology**—two and a half hours laboratory. 13. **History of Medicine**—one lecture half the term. 14. **Conference**—one medical.

**Lectures** 17; laboratory 7½ hours; demonstrations ½ hour; conference 1; recitations 6; section work 2; clinics 5.

**Fourth Year.**

1. **Theory and Practice**—three lectures; one recitation; two hours clinics. 2. **Neurology**—one lecture; one clinic.

3. **Gynecology**—one lecture. 4. **Obstetrics**—one lecture; one recitation. 5. **Surgery (including Orthopedics)**—four lectures; one recitation; three hours clinics. 6. **Specialties**—one recitation. 7. **Conferences**—one medical; one surgical. 8. **Clinical section work**—thirteen hours.

**Lectures** 10; recitations 4; conferences 2; clinics 6; clinical section work 13 hours.

The order of instruction for the ensuing session will be found in the catalogue of the Medical College, and may be obtained by application to the Registrar.

### **Laboratories**

**Practical Chemistry.** The chemical laboratory is well furnished and conveniently arranged, each student having a desk and reagents for his own use, and being supplied with all necessary apparatus. The laboratory course is preceded, since although some knowledge of chemistry is highly desirable, none is now **required** at entrance, by a series of lessons upon chemical nomenclature, notation and the essential principles of theoretical chemistry, including the laws of combination and valence, and these subjects are therefore more briefly treated in the regular lecture course. The practical laboratory work includes tests for those metals and acids which, in combination, are important as constituents of medicinal compounds or as poisons, together with the separation of the chief groups and the examination of unknown substances. The more important toxicological and urinary tests are performed and all chemical reactions are written upon the blackboard, discussed by the class, and entered upon their notes.

**Physiological Chemistry and Experimental Physiology.** A new laboratory for class work in Physiological Chemistry has been equipped in the south wing of the college building, and placed in charge of Holmes C. Jackson, Ph. D., who will conduct the laboratory work in this department. This work supplements that heretofore carried on in the departments of



physiology and chemistry, and combines a number of subjects which have formed parts of other courses. This course is included in the work of the second year, and demonstrations in experimental physiology and pharmacology, to be given at the Bender Laboratory, will be combined with it. These courses will be of much value to students by giving them a more thorough and practical knowledge of the experimental sciences upon which modern medicine largely rests.

### **Histology, Pathology, Bacteriology and Clinical Microscopy**

Work in these departments is carried on in the Bender Hygienic Laboratory, on Lake Avenue, near the Albany Hospital.

This building was erected by Mr. Matthew W. Bender, of Albany, and is thoroughly equipped with the apparatus necessary for the study of histology, pathology, bacteriology and clinical microscopy. Practical work in these branches is obligatory upon all students, and abundant opportunity is furnished in the laboratory for acquiring a thorough knowledge of these important subjects.

In histology the work consists of explanatory talks covering the subject of the day's study, followed by practical exercises in the laboratory.

In bacteriology the work consists of lectures followed by practical laboratory exercises. It is intended to render the student familiar with the underlying principles of bacteriology and their application to clinical medicine and surgery.

In pathology the work consists of a short lecture on the subject under discussion for the day followed by practical exercises in pathological anatomy and histology. Besides this the students are instructed in the technique of making autopsies, and material from autopsies and surgical operations is demonstrated to them as available. Demonstrations in experimental pathology are introduced whenever possible.

In clinical microscopy the course consists of preliminary talks followed by practical work in the examination of blood, urine, sputum, fæces, stomach contents, exudates, etc.; and includes a short course in clinical bacteriology.

In all these courses the student is taught independent methods of work and is required to keep a permanent record, illustrated by drawings, of all laboratory exercises.

A limited number of students who have shown proper aptitude are offered the opportunity to work along more advanced lines.

For the alumni of this school, and for physicians in the vicinity, this laboratory offers excellent facilities for the examination of urine, sputum, pathological specimens and blood. Information regarding such examinations may be obtained by communicating with Dr. Richard M. Pearce, Director.

### **Practical Clinical Courses**

In order to familiarize students with the practical work of their profession, and to bring them into closer personal contact with patients, the fourth year class is divided into sections of eight or ten men, and on four days in each week each man devotes several hours to the examination and personal observation, under the supervision of the instructors, of patients in the wards and out-patient departments of the various hospitals and dispensaries. In this clinical work especial attention is devoted to the complete examination of the blood, urine, sputum and stomach contents, as well as to the special examination of the eye, ear and other organs. Thus in the course of the school year the men in each section acquire practical knowledge and technical diagnostic dexterity in general medicine, general surgery, dermatology, neurology, insanity, otology, laryngology, ophthalmology, rhinology, diseases of children and infants, infant feeding, diseases of the rectum and genito-urinary tract, operative surgery, orthopedic surgery, operative obstetrics, electrotherapeutics and medical technique.

**Fees and Expenses**

Fees, excepting the final examination fee, are payable in advance, are not returnable, and are as follows:

**FIRST YEAR**

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Chemical Laboratory .....	10 00
Histological Laboratory .....	10 00
Dissection (including material) .....	5 00

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\$130 00

**SECOND YEAR**

Matriculation .....	\$ 5 00
Dissection (including material) .....	10 00
Lecture Course .....	100 00
Bacteriological and Pathological Laboratory .....	15 00
Physiological Chemistry and Experimental Physiology .....	15 00

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\$145 00

**THIRD YEAR**

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Clinical Microscopy, Surgical and Obstetrical Pathology .....	15 00

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\$120 00

**FOURTH YEAR**

Matriculation .....	\$ 5 00
Lecture Course .....	100 00
Final Examination .....	25 00

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\$130 00

In addition to the fees above stated, an annual charge of two dollars is made to members of the first, second and third year classes taking laboratory courses at the Bender Laboratory, for use of microscopes and other apparatus. This fee is paid to the director at the laboratory, and after laboratory tickets have been issued by the registrar. For the laboratory work in physiological chemistry there is a fee of two dollars to cover use of apparatus and breakage payable to the director at the beginning of the session. There is also a fee of five dollars paid by members of the fourth year class to the Guild for the Care of the Sick for the course in practical obstetrics.

The payment of three hundred dollars in advance entitles to attendance upon four courses of lectures, exclusive of laboratory and other special fees above stated, and effects a saving of one hundred dollars on the cost of the four-year course, **but this ticket must be taken out within thirty days from date of matriculation.** The final examination fee must be paid before the examinations begin. Graduates of the school may attend lectures and stated clinics without charge except for matriculation in case of prolonged attendance.

The cost of living in Albany is less than in most other cities of its size. The janitor of the college keeps a list of boarding houses at which good rooms and board can be obtained at from four to five dollars a week or upwards, and by clubbing together students can live comfortably at still lower rates.

### **Requirements for Graduation**

The candidate must be twenty-one years of age, and exhibit a certificate from a physician or surgeon, duly authorized by law to practice his profession, that he has studied medicine and surgery under his instruction during the period required by law in this state, and he must present evidence of having complied with the law concerning preliminary examination.

He must have attended not less than four regular courses of lectures, of which the last shall have been at this college. Students who have attended one or more courses of lectures at other recognized medical colleges, who may desire to be admitted to advanced standing in this college, will be credited with the work they may have done and with examinations they may have passed, other than those of the senior year, if satisfactory evidence of such attendance and of the passing of such examinations is presented.

He must be of good moral character.

He must maintain a satisfactory standing during his course and pass a satisfactory final examination in the several branches taught.

Regular and punctual attendance is required, and matriculation tickets are endorsed with attendance at the end of the term.

For catalogues or further information address

WILLIS G. TUCKER, M. D., *Registrar*,  
Albany, N. Y.

*January 1, 1907*





**ALBANY LAW SCHOOL**

**ALBANY, N. Y.**

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**LAW DEPARTMENT**

**UNION UNIVERSITY**

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**FIFTY-SEVENTH YEAR**

**1907-1908**

## ALBANY LAW SCHOOL

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This School is among the oldest institutions of the kind in the country, having been established in 1851, and its graduates number many of the most successful men in the profession. The school is and has been largely represented in the Executive, Judicial and Legislative departments of this and many other States, as well as of the federal government.

It became a part of Union University in 1873, and begins its fifty-seventh year as a law school with the present scholastic year. During its long and successful career it has, in common with other law schools, done much to demonstrate what was at one time doubtful, but is now accepted almost as an axiom, that a course at the law school is a well-nigh necessary prerequisite to a successful professional career. Its instructors have always been men of repute and standing, both for professional learning and personal character.

### Local Advantages

The local advantages of the city of Albany, as the seat of a professional school, can not be overrated. It is the capital of one of the leading States in the Union, whose legislature is in session here for the third part of the year, presenting opportunities not afforded by any other Law School in the State for observing the methods and procedure collectively of the executive, judicial and legislative departments of the State government. The knowledge thus obtained by the students at law, who are to complete their course and to enter the realm of public affairs, can not be overestimated.

It is easily accessible, remarkably healthful, and the scene of great business and professional activity. It is large enough to afford its inhabitants all the means of culture and recreation naturally to be looked for in a city, while it is not so large as to make the cost of living burdensome, even to persons of extremely limited means.

**Facilities for Study**

The facilities afforded the students for reading and study are unsurpassed.

Besides the convenient and well chosen library of the school accessible to the students at all hours of the day and evening, the students have the privilege of using the State Law Library, the most extensive and best selected in the United States, consisting of 65,000 volumes or more.

With free access to these libraries the student may be relieved to a great extent from purchasing text-books.

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### **Special Lecturers**

The list of special lecturers is a notable one, including the former Chief Judge and two Associate Judges of the Court of Appeals, a Justice of the Supreme Court and a former Supreme Court Justice.

### **Hubbard Chair of Legal Ethics**

The circulars of seventy of the leading Law Schools of the country show that only twenty of this number make the subject of Legal Ethics part of their curriculum. With two exceptions, those schools are either in the West or South. These facts led Gen. Thomas H. Hubbard, class of '60, to place at the disposal of the Board of Trustees the sum of \$10,000, the income to be applied to lectures upon this subject. The Board of Trustees decided to inaugurate the course at the opening of the school year of 1903. Gen. Hubbard, the founder of the chair, delivered the opening lecture, and will be followed during the academic year 1906-7 by Judge William E. Werner of the Court of Appeals, Hon. Alton B. Parker, late Chief Judge of that Court, and others.

**Academic Year**

The full academic course leading to the degree of LL. B. is two years, divided into two semesters each.

**Requirements for Admission to Junior Class**

The full course of study consists of two scholastic years. Any student who has conformed to the requirements of the Regents as to general education, or satisfies the Faculty that he will so conform to such requirements within the year allowed by the Regents for that purpose, after commencing the study of law, may enter the Junior class, and upon completion of the two years' course and passing the required examinations will be graduated with the degree of LL. B.

College graduates will find this course well adapted to the requirements of the Court of Appeals, requiring them to study law two calendar years after graduation. They can enter the school upon presentation of their certificate of graduation, without examination, attend the full course of two years, of not less than eight months each, receive the degree of LL. B., and take the bar examination in June following their graduation from the school.

**Requirements for Admission to Senior Class**

Any student not a college graduate who has completed two years of required legal study, after conforming to the requirements of the Regents as to general education, or any college graduate who has completed one year of such study after graduation, will be admitted to the Senior class without examination upon production of the Regents' certificates and certificate of Clerk of Court of Appeals, and will be admitted to the privileges of the class but will not be received as a candidate for graduation.

Students who have attended a law school and satisfactorily completed the work of the Junior year will be allowed to



enter as candidates for a Degree in the discretion of the Faculty.

The degree of LL. B. will be conferred only upon students who have completed the entire course of two years at a law school.

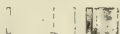
### **Tuition**

The fees for tuition are payable in advance, as follows: For the full course of one year, tuition, \$100; matriculation fee, \$10; diploma fee, \$10; or \$60 for the first semester and \$60 for the second. For the full course of two years and degree of LL. B., tuition, \$100 each year; matriculation fee, \$10; degree, \$10; or \$60 for the first semester and \$50 for each semester thereafter, except the last, which will be \$60.

For catalogues or further information address

ALBANY LAW SCHOOL, ALBANY, N. Y.

JNO. J. HUGHES, Secretary.





**DUDLEY OBSERVATORY**

**ALBANY, N. Y.**

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## THE DUDLEY OBSERVATORY

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The Dudley Observatory is located on Lake Avenue, in the southwestern part of Albany, to which site it was removed in 1893 from its former location in the northern part of Albany. It is devoted to original researches in astronomy, according to the purpose of its founders and successive patrons. Its contributions to science are represented in two volumes of "Annals," and in other published volumes and memoirs contained in the transactions of learned societies and astronomical journals. Its principal line of work at the present time is the determination of problems relating to the positions and motions of the stars and of the solar system as a whole. The staff consists of the director, four assistants and seven computers.

The instrumental equipment of the Observatory is designed for the purposes of exact measurement in line with its chosen work. In the tower of the main building is the Pruyn Equatorial, with object-glass twelve inches in diameter. This instrument is equipped both for visual and photographic use, and is of a high order of mechanical perfection. The Olcott Meridian Circle is located in a separate building, especially designed for securing the utmost equality in the temperature between the external air and that in the building itself. Its object-glass is eight inches in diameter. It was made by Pistor and Martins, of Berlin, and is regarded by astronomers as a masterpiece of accurate workmanship. This instrument has been employed for many years in obtaining the measurements necessary for the construction of the numerous and elaborate star catalogues which have issued from the Dudley Observatory.

In addition to these instruments, the Observatory is in possession of various small telescopes, clocks, chronographs and smaller apparatus.

The institution is supported by an endowment, chiefly contributed by Mrs. Blandina Dudley, the late Catharine W. Bruce, and Hon. Frederic P. Olcott, as well as by appropria-

tions which have been received from the National Academy of Sciences, and from current contributions of trustees and friends of the institution.

Since 1902, annual grants have been made to the Director of the observatory by the Carnegie Institution of Washington. These have been sufficient to provide for the entire force of assistants and computers now employed. In 1905, the Carnegie Institution made special provision for carrying on the star researches upon which the Observatory is engaged for a period of ten years. This includes an appropriation which enables the Observatory to send the Olcott Meridian Circle to the Southern Hemisphere for several years with an ample force of observers, in order to carry out an essential feature of its investigations. It is intended that the expedition will be prepared to begin operations in the Southern Hemisphere in 1908.

The Dudley Observatory is not designed to give general instruction in Astronomy, though special students contemplating instruction in professional lines have been received from time to time under an arrangement of computing service to the Observatory.

The Observatory is opened to visitors on Tuesday evening of each week from 8 to 10 o'clock.

For further particulars apply to

LEWIS BOSS,

Director.



ALBANY COLLEGE OF PHARMACY

ALBANY, N. Y.

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DEPARTMENT OF PHARMACY OF

UNION UNIVERSITY

## ALBANY COLLEGE OF PHARMACY

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The Albany College of Pharmacy was created by act of the Board of Governors of Union University, June 21, 1881, and constitutes the **Department of Pharmacy of Union University**. It was incorporated as the "Albany College of Pharmacy," August 27, 1881.

The exercises of the college are held in the Albany Medical College building on Eagle street, distant but a block from the Capitol, and in the pharmaceutical laboratory on Maiden Lane. The lecture rooms and laboratories are well adapted to the needs of the college and furnish to the faculty excellent facilities for imparting instruction. The lectures are delivered in the chemical lecture room on the first floor, adjoining which is the large and well fitted chemical laboratory, where instruction is given to the classes in practical chemistry. The collections in the different departments are very complete and afford the instructors ample facilities for the illustration of the lectures.

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EDWARD N. MCKINNEY

**FACULTY**

---

ANDREW VAN VRANKEN RAYMOND, D. D., LL. D.  
Chancellor of the University

---

WILLIS GAYLORD TUCKER, M. D., PH. D., Dean  
Professor of Chemistry

ALFRED BIRCH HUESTED, M. D., PH. G.  
Professor of Botany and Materia Medica

GUSTAVUS MICHAELIS, PH. G.  
Emeritus Professor of Pharmacy

---

THEODORE JAMES BRADLEY, B. S., PH. G., Secretary  
Lecturer on Pharmaceutical Mathematics and Instructor in  
Chemistry

GARRET VANDER VEER DILLENBACK, PH. G.  
Associate Professor of Pharmacy

EDWIN CUNNINGHAM HUTMAN, PH. G.  
Director of Pharmaceutical Laboratory

ARTHUR TURNER LAIRD, M. D.  
Instructor in Microscopy

JAMES EMMETT HUESTED  
Instructor in Materia Medica and Pharmacognosy

WILLIAM ATWOOD LARKIN, PH. G.  
Instructor in Physics

**Calendar for 1907-1908****1907**

Introductory lecture, Monday, October 7.

Election vacation, Monday and Tuesday, November 4 and 5.

Thanksgiving vacation begins Wednesday, November 27.

Lectures resumed Monday, December 2.

Christmas vacation begins Monday, December 23.

**1908**

Lectures resumed Monday, January 6.

Commencement (date to be announced).

**Entrance Requirements**

All applicants for admission to regular standing in this college must be at least seventeen years of age and will be required to present a PHARMACY STUDENT CERTIFICATE issued by the New York State Education Department. The requirement for this certificate is the completion of the first year's course in a recognized high-school or academy, or evidence of an equivalent education. Inquiries concerning this preliminary requirement may be addressed to the New York State Education Department, Albany, N. Y.

**The Curriculum**

of the college embraces:

**Chemistry**—Theoretical, General, Pharmaceutical and Analytical.

**Botany**—Structural, Systematic and Analytical.

**Materia Medica and Pharmacognosy.**

**Pharmacy**—Theoretical and practical.

**Microscopy**—Theoretical and practical in its relations to Pharmacy.

**Pharmaceutical Mathematics, Physics.**

### Requirements for Graduation

The diploma of this college confers the degree of GRADUATE IN PHARMACY (Ph. G.). Applicants for this degree must have had the required preliminary education, be of good moral character, have attended two full courses of lectures (which shall have included all laboratory practice) in this college, or the last course in this college and the first in some other registered college of pharmacy; have passed satisfactory examinations and paid all fees as hereafter stated.

#### Fees for Tuition

##### EACH YEAR

Matriculation .....	\$ 5 00
Tuition .....	70 00

Students who have attended two full courses of lectures at this college may attend further courses without extra charge. Payment of fees for matriculation, and for laboratory, and recitation courses will, however, be required, should the courses be taken.

#### Situations

Students desirous of obtaining employment while attending college will be assisted as far as possible in securing situations, but employment cannot be promised in advance, and places cannot be secured by correspondence. During the past year the faculty has had a much larger number of openings offered for graduates to lucrative positions than it has been able to fill. The demand on the part of employers for skilled assistants is steadily increasing, and a college diploma or license from an examining board is demanded by law of those who engage in the practice of pharmacy in most of the states and cities of the Union.

For separate catalogue giving more complete information address

THEODORE J. BRADLEY, PH. G., Secretary,  
4 Lancaster Street, Albany, N. Y.



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# Union College Bulletin

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Vol. I

NOVEMBER 1907

No. 1



## University Catalogue Number

1907-1908

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UNION COLLEGE  
SCHENECTADY, NEW YORK

Published Quarterly by the College in November, February,  
May and August

Application pending for admission to the mails as second-class matter

## Correspondence

Correspondence addressed simply to Union College, Schenectady, New York, may be expected to reach the proper department, but in order to avoid delay, correspondents are requested to note the following suggestions:

Communications relating to administrative matters and correspondence bearing upon the general interests of the College should be addressed to the President.

Inquiries concerning scholarships and other matters pertaining to undergraduates or to undergraduate work, and correspondence concerning graduate work should be addressed to the Dean.

Requests for the annual catalogue and other publications, inquiries relating to the admission of undergraduate students, and inquiries or information concerning alumni should be addressed to the Secretary of the Faculty.

Communications relating to any of the professional schools in Albany should be addressed to the Dean of that school.





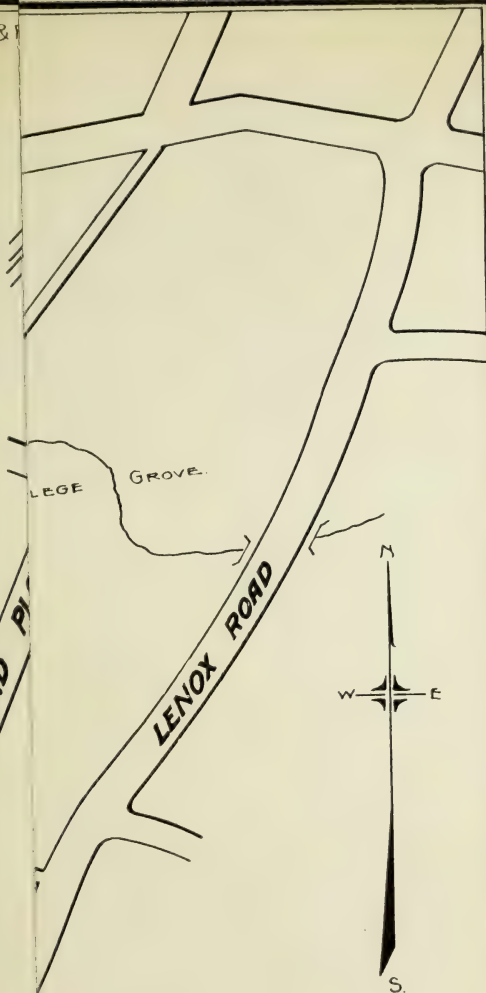
## Form of Bequest to Union College

---

I give, devise and bequeath to the Trustees of Union College, in the town  
of Schenectady, in the State of New York, the.....  
.....

# INDEX TO RESIDENCES &

1. PRESIDENTS HOUSE
2. PROF HOFFMAN
- PROF BARNES
3. PROF ELLERY
4. PROF STOLLER
5. PROF HALE
6.  $\Phi\Delta\Theta$  FRATERNITY
7. PROF ASHMORE
8.  $\Lambda\Delta\Phi$  FRATERNITY
9.  $\Sigma\Phi$  FRATERNITY
10.  $\chi\psi$  FRATERNITY
11.  $\psi\gamma$  FRATERNITY
12. ASST TREAS. POND
13.  $\kappa\alpha$  FRATERNITY
14. PROF WELLS
15. PROF MCKEAN
16. MRS BENEDICT
17. PROF LANDRETH
18.  $\Phi\Gamma\Delta$  FRATERNITY



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## MAP OF

UNION COLLEGE AND GROUNDS

SHOWING BUILDINGS, ETC.

SCHENECTADY, NEW YORK.

1907.  
SCALE.

100 200 300 400 500 600 700 800

# INDEX TO RESIDENCES & FRATERNITIES

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- 7 G.D. FRATERNITY
- 8 PROF. ASHMORE
- 9 A.D. FRATERNITY
- 10 X. FRATERNITY
- 11 Y. FRATERNITY
- 12 ASST. TREAS. POND
- 13 K.A. FRATERNITY
- 14 PROF. WELLS
- 15 PROF. M'KEAN
- 16 MRS. BENEDICT
- 17 PROF. LANDRETH
- 18 G.D. FRATERNITY

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CHapel  
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ENG. LAB.

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MAP OF  
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SHOWING BUILDINGS, ETC.

SCHENECTADY, NEW YORK  
1907  
SCALE



ANNUAL CATALOGUE  
OF  
UNION UNIVERSITY



---

1907-1908

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PRESS OF  
BRANDOW PRINTING COMPANY  
ALBANY, NEW YORK





UNION UNIVERSITY

# COLLEGE CALENDAR FOR 1908

	S	M	T	W	T	F	S		S	M	T	W	T	F	S
Jan	..	..	..	1	2	3	4	July	..	..	..	1	2	3	4
	5	6	7	8	9	10	11		5	6	7	8	9	20	11
	12	13	14	15	16	17	18		12	13	14	15	16	17	18
	19	20	21	22	23	24	25		19	20	21	22	23	24	25
	26	27	28	29	30	31	..		26	27	28	29	30	31	..
Feb.	..	..	..	..	..	..	1	Aug.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8		2	3	4	5	6	7	8
	9	10	11	12	13	14	15		9	10	11	12	13	14	15
	16	17	18	19	20	21	22		16	17	18	19	20	21	22
	23	24	25	26	27	28	29		23	24	25	26	27	28	29
Mar.	..	..	..	..	..	..	..	Sept.	..	..	..	..	..	..	..
	1	2	3	4	5	6	7		..	..	1	2	3	4	5
	8	9	10	11	12	13	14		6	7	8	9	10	11	12
	15	16	17	18	19	20	21		13	14	15	16	17	18	19
	22	23	24	25	26	27	28		20	21	22	23	24	25	26
Apr.	29	30	31	..	..	..	..	Oct.	27	28	29	30	..	..	..
	..	..	..	..	..	..	..		..	..	..	..	..	..	..
	..	..	..	1	2	3	4		..	..	..	..	1	2	3
	5	6	7	8	9	10	11		4	5	6	7	8	9	10
	12	13	14	15	16	17	18		11	12	13	14	15	16	17
May	19	20	21	22	23	24	25	Nov.	18	19	20	21	22	23	24
	26	27	28	29	30	..	..		25	26	27	28	29	30	31
	..	..	..	..	..	..	..		..	..	..	..	..	..	..
	..	..	..	..	..	1	2		..	..	..	..	..	..	..
	3	4	5	6	7	8	9		1	2	3	4	5	6	7
June	10	11	12	13	14	15	16	Dec.	8	9	10	11	12	13	14
	17	18	19	20	21	22	23		15	16	17	18	19	20	21
	24	25	26	27	28	29	30		22	23	24	25	26	27	28
	31	..	..	..	..	..	..		29	30	..	..	..	..	..
	..	..	..	..	..	..	..		..	..	..	..	..	..	..
	..	1	2	3	4	5	6		..	..	1	2	3	4	5
	7	8	9	10	11	12	13		..	..	6	7	8	9	10
	14	15	16	17	18	19	20		13	14	15	16	17	18	19
	21	22	23	24	25	26	27		20	21	22	23	24	25	26
	28	29	30	..	..	..	..		27	28	29	30	31	..	..

Figures in heavy type indicate days on which Union College is in session

## UNIVERSITY CALENDAR

---

1908

- |             |   |
|-------------|---|
| 2 Jan.      | Registration Day for Students, Winter term,<br>Union College                                  |
| 3 Jan.      | Recitations begin, Union College  |
| 6 Jan.      | Winter term of Medical College resumes  |
| 6 Jan.      | Winter term College of Pharmacy resumes   |
| 23 Jan.     | Day of Prayer for Colleges  |
| 31 Jan.     | First semester of Law School ends   |
| 3 Feb.      | Second semester of Law School begins  |
| 15 Feb.     | Allison-Foote Prize Debate between the Lit-<br>erary Societies                                |
| 22 Feb.     | Washington's Birthday   |
| 7 March     | Examination for condition students  |
| 21 March    | Winter term of Union College ends   |
| 23 March    | Registration Day for Students, Spring term,<br>Union College                                  |
| 24 March    | Recitations begin, Union College  |
| 17-20 April | Easter Recess, Union College  |
| 14 April    | Commencement of the College of Pharmacy   |
| 15 April    | Selection of Junior and Sophomore prize<br>orators  |
| 2 May       | Examination for conditioned students  |
| 15 May      | Date for presentation of prize essays   |
| 19 May      | Commencement of the Medical College   |
| 22 May      | Senior Examinations end   |
| 30 May      | Memorial Day  |
| 3 June      | Commencement of Law School  |
| 7 June      | Sunday. Baccalaureate Sermon, Union Col-<br>lege  |
| 8 June      | Prize Contest in Extemporaneous Speaking,<br>and Prize Oratory of Juniors and Sopho-<br>mores |
| 9 June      | Meeting of Trustees, Phi Beta Kappa, Sigma<br>Xi, Alumni                                      |
| 10 June     | Commencement of Union College, the second<br>Wednesday in June, President's reception         |

## University Calendar—Continued

1908

- 11-12 June Entrance Examinations, Union College  
 12 Sept. Examination for conditioned students  
 14 Sept. Registration Day for Freshmen, Union College  
 16 Sept. Registration Day for Students other than Freshmen, Union College. Entrance Examinations, Union College  
 17 Sept. First Chapel Exercises and Recitations, Entrance Examinations concluded  
 18 Sept. Freshman Recitations begin  
 22 Sept. Registration Day, Law School  
 22 Sept. Winter term of Medical College begins  
 23 Sept. Law School begins  
 5 Oct. The College of Pharmacy begins  
 3 Nov. Election Day  
 26 Nov. Thanksgiving Day. Recess four days  
 5 Dec. Examination for conditioned students  
 22 Dec. Fall term of Union College ends

1909

- 4 Jan. Registration Day for Students, Winter term, Union College  
 4 Jan. Winter term of Medical College resumes  
 4 Jan. Winter term of College of Pharmacy resumes  
 5 Jan. Recitations begin, Union College  
 28 Jan. Day of Prayer for Colleges  
 29 Jan. First semester of Law School ends  
 1 Feb. Second semester of Law School begins  
 13 Feb. Allison-Foote Prize Debate between the Literary Societies  
 22 Feb. Washington's Birthday  
 6 March Examination for conditioned students  
 20 March Winter term of Union College ends

## University Calendar—Concluded

1909

- |            |   |
|------------|---|
| 22 March   | Registration Day for Students, Spring term,<br>Union College                            |
| 23 March   | Recitations begin, Union College  |
| 9-12 April | Easter Recess, Union College  |
| 6 June     | Sunday. Baccalaureate Sermon, Union College   |
| 7 June     | Prize Contest in Extemporaneous Speaking and<br>Prize Oratory of Juniors and Sophomores |
| 8 June     | Meeting of Trustees, Phi Beta Kappa, Sigma<br>Xi, Alumni                                |
| 9 June     | Commencement of Union College, the second<br>Wednesday in June. President's reception   |
| 10-11 June | Entrance Examinations, Union College  |

## UNION UNIVERSITY

---

Union University embraces the following institutions:

UNION COLLEGE .....	Founded 1795
ALBANY MEDICAL COLLEGE .....	Founded 1838
ALBANY LAW SCHOOL .....	Founded 1851
DUDLEY OBSERVATORY .....	Founded 1852
ALBANY COLLEGE OF PHARMACY .....	Founded 1881

Union College acquired by its charter, granted in 1795, full university powers, but the creation of graduate institutions at Schenectady was not found practicable. Schools of Law and Medicine and also an Astronomical Observatory have long existed at Albany, only a few miles distant. The arrangement naturally suggested by these circumstances was, that the professional schools and the observatory at Albany should be united with Union College, under the charter and Board of Trustees of the latter. This was accordingly effected by the incorporation of Union University in 1873. The Albany College of Pharmacy was created by the Board of Governors, June 21, 1881, and incorporated as a department of the University, August 21 of the same year.

The President of Union College and permanent Chancellor of Union University has the oversight of the University, each of the institutions having its resident Dean. The Dean of Union College acts in the place of the President in his absence, and also assists him in matters delegated to him by the President. The University Board of Governors is composed of permanent trustees of Union College and of representatives of each of the other institutions embraced in Union University.

## OFFICERS OF THE UNIVERSITY

---

Chancellor ad interim

REV. GEORGE ALEXANDER, D. D.

## Honorary Chancellor, 1907

HON. JOSEPH E. RANDELL, LL. D.

## Board of Governors

## PRESIDENT

SIMON W. ROSENDALE, Albany

## SECRETARY

AMASA J. PARKER, LL. D., Albany

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## Albany Medical College

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ALDEN CHESTER.....Albany

## Albany Law School

AMASA J. PARKER, LL. D.....Albany

J. NEWTON FIERO, LL. D.....Albany

## Dudley Observatory

SAMUEL B. WARD, M. D., PH. D.....Albany

BENJAMIN WALWORTH ARNOLD.....Albany

## Albany College of Pharmacy

WILLIS G. TUCKER, M. D., PH. D.....Albany

CHARLES NEWMAN .....Albany

UNIVERSITY FACULTY

---

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Chancellor ad interim

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Dean of the College of Pharmacy, Registrar of the  
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Professor of Surgery

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Professor Emeritus of Materia Medica, Therapeutics and  
Diseases of the Throat and Nose

## UNION UNIVERSITY

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Anthony Professor of Pathological Anatomy, Histology, and  
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Professor of Physiology

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Professor of Biology and Geology

EDWARD EVERETT\*HALE, JR., PH. D.

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LEWIS R. PARKER

Professor of the Law of Bailments, Bills and Notes, and of  
Guarantee and Suretyship

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JOHN I. BENNETT, A. B.

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## UNION UNIVERSITY

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EDWARD ELLERY, A. M., PH. D.

Professor of Chemistry

FRANK WHITE

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GEORGE LAWYER

Professor of the Law of Contracts

FRANK B. GILBERT

Professor of the Law of Real Property

FRANK COE BARNES, A. M., PH. D.

Professor of Modern Languages

HORACE GRANT McKEAN, A. M.

Professor of Rhetoric and Public Speaking

ALVAH S. NEWCOMB

Professor of the Law of Damages

ANDREW MacFARLANE, M. D.

Professor of Physical Diagnosis and Medical Jurisprudence,  
and Law School Lecturer on Medical Jurisprudence

ARTHUR G. ROOT, M. D.

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LEO NEUMAN, M. D.

Professor of Gastro-Enteric Diseases, and Clinical Professor  
of the Theory and Practice of Medicine

HON. ALTON B. PARKER, LL. D.

Lecturer on Development of the Law

HON. IRVING G. VANN, LL. D.

Lecturer on the Law of Insurance

HON. D. CADY HERRICK

Lecturer on Municipal Corporations

HON. WILLIAM E. WERNER

Lecturer on Constitutional Law

HON. ALDEN CHESTER

Lecturer on the Federal Judicial System

HON. WALTER E. WARD

Lecturer on Copyrights and Trade Marks

STEPHEN B. GRISWOLD

Lecturer on Books and Their Uses

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Microscopy and Pharmacognosy

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Adjunct Professor of Physiological Chemistry, and Director  
of Laboratory in the Medical College

THEODORE J. BRADLEY, M. D.

Adjunct Professor of Inorganic Chemistry and Pharmaceutical Mathematics

GARRET VANDER VEER DILLENBACK, PH. G.

Associate Professor of Pharmacy

HERMAN BENDELL, M. D.

Clinical Professor of Otology

JESSE M. MOSHER, M. D.

Clinical Professor of Insanity, Neurology and Electro-Therapeutics

HARRY JUDSON LIPES, M. D.

Clinical Professor of Obstetrics

ELMER E. F. CREIGHTON, B. S., E. E.\*

Assistant Professor of Electrical Engineering

EDGAR A. VANDER VEER, M. D.

Clinical Professor of Surgery

ARTHUR W. ELTING, M. D.

Clinical Professor of Surgery, and Lecturer on Surgical Pathology

JOHN A. SAMPSON, M. D.

Clinical Professor of Gynecology

ARTHUR SAUTTER, M. D.

Clinical Professor of Dermatology and Lecturer on Genito-Urinary Diseases

---

\* Absent on leave.



GEORGE E. LOCHNER, M. D.

Clinical Professor of Gynecology

CLEMENT F. THEISEN, M. D.

Clinical Professor of Diseases of the Throat and Nose

HENRY LARNED KEITH SHAW, M. D.

Clinical Professor of Diseases of Children

C. F. F. GARIS, PH. B.

Assistant Professor of Mathematics

JOHN W. HUGHES, B. S. in C. E.

Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. in E. E.

Assistant Professor of Electrical Engineering

ARTHUR JAY ROY, C. E., A. M.

Assistant in Dudley Observatory

WILLIAM OLIN STILLMAN, M. D.

Lecturer on the History of Medicine

CHARLES HARPER RICHARDSON, M. D.

Lecturer on Surgical Technic

ARTHUR TURNER LAIRD, M. D.

Lecturer on Clinical Microscopy

CHARLES HENRY MOORE, M. D.

Lecturer on Ophthalmology and Otology

HERBERT DODGE PEASE, M. D.

Lecturer on Antitoxins and Immunity

WILFRED SYLVESTER HALE, M. D.

Lecturer and Demonstrator in Anatomy and Assistant Curator of the Museum

WILLIAM B. VARNUM, A. B.

Assistant in Dudley Observatory

JAMES FRANCIS ROONEY, M. D.

Lecturer on Hygiene and Instructor in Medicine

HOWARD E. LOMAX, M. D.

Lecturer and Assistant Demonstrator in Anatomy

GEORGE G. LEMPE, M. D.

Lecturer on Anatomy

LA SALLE ARCHAMBAULT, M. D.

Lecturer on Neurology

GEORGE E. BEILBY, M. D.

Lecturer on Histology

ARTHUR F. HOLDING, M. D.

Lecturer on Radiography

WILLIAM A. LARKIN, M. D.

Lecturer on Inorganic Chemistry, and Instructor in Organic Chemistry and Physics

ALVAH HARRY TRAVER, M. D.

Instructor in Surgery

EDGAR ROSCOE STILLMAN, M. D.

Instructor in Physiology

EDWARD WATERBURY BECKER, M. D.

Instructor in Physiology

HARRY WARDELL CAREY, M. D.

Instructor in Physiology and Physiological Chemistry

PUTNAM CADY, A. M., F. R. G. S.

Lecturer on Archaeology

EDWIN CUNNINGHAM HUTMAN, PH. G.

Director of Pharmaceutical Laboratory

LEO FRANK ADT, M. D.

Instructor in Ophthalmology

EDWARD GERALD GRIFFIN, M. D.

Instructor in Materia Medica and Therapeutics

JAMES WESLEY WILTSE, M. D.

Instructor in Dermatology and Genito-Urinary Diseases

CHARLES KNICKERBACKER WINNE, JR., M. D.

Instructor in Theory and Practice of Medicine

EDWIN FORREST SIBLEY, M. D.

Instructor in Surgical Pathology

---

Instructor in Anatomy and Prosecutor of Anatomy

*UNION UNIVERSITY*

JAMES EMMETT HUESTED

Instructor in Materia Medica

JOSEPH ALOYSIUS LANAHAN, M. D.

Instructor in Dermatology

HARRY RAYMOND, A. B.

Assistant in Dudley Observatory

DANIEL A. YOUNG, B. S. in C. E.

Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.

Instructor in Physical Culture

JAMES H. CUNNINGHAM, B. E.

Instructor in Electrical Engineering

MORLAND KING, B. E., M. E. E.

Instructor in Electrical Engineering

CYRUS A. MELICK, C. E.

Instructor in Civil Engineering

HARRY RULISON, M. D.

Instructor in Clinical Microscopy

WILBERT A. GARRISON, A. M.

Instructor in Engineering Mathematics

---

Instructor in Engineering Drawing

OSCAR VON VOIGTLANDER, M. E.  
Instructor in Civil Engineering

DAVID HUTCHISON, A. M., B. D.  
Instructor in History

FRANK W. SMITH, A. B.  
Instructor in Modern Languages

BRANSON K. DE VOE, M. D.  
Instructor in Anatomy

EUGENE E. HINMAN, M. D.  
Instructor in Diseases of the Throat and Nose

JOHN H. GUTMAN, M. D.  
Instructor in Surgery and Obstetrics

JAMES N. VANDER VEER  
Instructor in Genito-Urinary Surgery

MALCOLM DOUGLAS, M. D.  
Instructor in Histology

CHARLES W. L. HACKER, M. D.  
Instructor in Surgical Pathology

CLINTON B. HAWN, M. D.  
Instructor in Pathology and Bacteriology

HAROLD P. SAWYER, M. D.  
Instructor in Pathology and Bacteriology

*UNION UNIVERSITY*

THEOBALD F. DOESCHER, M. D.

Instructor in Pathology and Bacteriology

ERASTUS CORNING, M. D.

Instructor in Theory and Practice of Medicine

MEADE L. ZIMMER, A. B.

Assistant in Dudley Observatory

ALBERT S. EASTMAN, B. S.

Assistant in Chemistry

## STUDENTS OF UNION COLLEGE

## Abbreviations

*c*, A. B. course; *ls*, Ph. B. course; *s*, B. S. course; *e*, B. E. course in General Engineering; *se*, B. E. course in Sanitary Engineering; *ee*, B. E. course in Electrical Engineering; *els*, B. E. General Engineering and Ph. B. six year course; N. S., North Section; M. S., Middle Section; S. S., South Section; N. C., North College; S. C., South College.

## Candidates for the Degree of Master of Arts

Leslie Nathan Broughton, A. B.....*Victor*  
 Samuel B. Howe, Jr., A. B.....*Plainfield, N. J.*  
 Lewis Tiffany Hunt, Ph. B.....*Schenectady*  
 George Le Roy Shelley, A. B.....*Mercersburg, Pa.*  
 Charles N. Waldron, B. S.....*Detroit, Mich.*  
 Meade La Fayette Zimmer, Ph. B.....*Dudley Observatory, Albany*

## Graduate Student

J. T. Appleton.....*Manchester, England..Φ Γ Δ House*

## Seniors, Class of 1908

*e* Thomas Sherwood Bailey.....*Burnt Hills.....B Θ Π House*  
*ls* Henry Winne Bell.....*Albany.....K A Lodge*  
*e* James Edward Bell.....*Westmoreland.....Φ Δ Θ House*  
*e* Emanuel Herbert Bocian.....*Chicago, Ill.....S. S. N. C.*  
*ls* Louis Maynard Bryant.....*Le Roy.....Δ T House*  
*c* Albert Willard Clark.....*Schenectady.....609 Union St.*



e	Walter John Clark.....	Middleburg.....	118 Park Place
e	Willard D. Covey.....	Lyons Falls.....	N. S. N. C.
ls	Arthur Edgar Davies.....	Schenectady.....	Δ T House
e	Michael J. J. Dwyer.....	Troy.....	407 3rd St., Troy
e	Cornelius Ernest Elmendorf....	Coeymans Hollow....	B Θ II House
e	John Benjamin Flowers.....	Schenectady.....	303 Victory Ave.
e	Ernest Johnson Fuller.....	Warwick.....	K A Lodge
ls	Chester G. Fullerton.....	Schenectady.....	6 Chestnut St.
e	David Grant.....	Green Island.....	Φ Γ Δ House
s	Thomas Edward Hanigan.....	Schenectady.....	938 State St.
e	Leon C. Heilbronner.....	Schenectady.....	238 Union St.
e	Ferdinand Helm.....	Saratoga Springs.....	Δ Φ House
c	Hiram Thomas Hildreth.....	Herkimer.....	A Δ Φ House
e	William Dueltton Hildreth.....	Herkimer.....	A Δ Φ House
e	Leland Silas Hoffman.....	St. Johnsville.....	K A Lodge
e	Harold Warner Jewell.....	Schenectady.....	12 Chestnut St.
e	Harold Lansing Keith.....	Schenectady.....	1030 State St.
ls	Arthur Beach King.....	Troy.....	Σ Φ Place
e	Alexander Dorn Kline.....	Schenectady..	300 Parkwood Blv'd
e	Albert Southard Knight.....	Round Lake.....	B Θ II House
ls	Edwin L. LaCrosse.....	Schenectady.....	7 Chestnut St.
e	Arthur Lewis LaRoche .....	Binghamton.....	Ψ T House
e	Robert Fuller MacMullen.....	Schenectady.....	519 Hamilton St.
e	Augustine Marx.....	Amsterdam .....	Φ Γ Δ House
ls	Walter Scott McNab.....	Schenectady.....	13 Romeyn St.
c	Herman Lewis Meyer.....	Green Island .....	B Θ II House
s	James P. Minahan.....	Schenectady.....	K A Lodge
e	Arba Romans Morse.....	Sidney C'tre.	118 Van Vranken Av.

e	Charles Franklin Mulrooney	Albany	237 Park Place
e	John Frederick Nash	Plattsburg	M. S. N. C.
s	Levi Parsons	Gloversville	K A Lodge
e	Frederick Royal Peck	Deansboro	Φ Δ Θ House
e	Edward J. Penrose	Cohoes	S. S. N. C.
c	Andrew Van V. Raymond, Jr.	Schenectady	A Δ Φ House
e	Raymond O. Shelley	Albany	Ψ T House
c	Philip Foster Shutler	Utica	Φ Δ Θ House
e	Frank R. Stevens	Mechanicville	Ψ T House
s	Ross Williams Tiffany	Schenectady	129 Furman St.
e	Wayne A. Vandegrift	Newport News, Va.	M. S. N. C.
e	Carl H. Vogt	Buffalo	Φ Δ Θ House
c	Mark Skinner Watson	Plattsburg	Σ Φ Place
ls	Martin Henry Weyrauch	Liberty	Δ T House
e	Royton F. Wheadon	Johnstown	Δ Φ House
c	Joseph Thatcher Wright	Pulaski	A Δ Φ House
e	George William Wright	Ogdensburg	Φ Γ Δ House

Seniors—51

### Juniors, Class of 1909

e	Floyd Elmer Allen	Elmira	M. S. S. C.
e	Stanley C. Bayless	Binghamton	Ψ T House
e	Thomas Bernard Bergan	Auburn	South Colonnade
e	William Waldo Brown	Brooklyn	Ψ T House
e	Robert L. Brunet	Petersburg, Va.	Σ Φ Place
e	Clarence E. Burleigh	Plattsburg	S. S. N. C.
e	Francis William Burleigh	Plattsburg	S. S. N. C.
ls	James Bradin Chapman	Broadalbin	Δ Φ House

s	Francis Temple Chase.....	Utica.....	M. S. N. C.
s	Adelbert Garry Clark.....	Elmira.....	Ψ T House
e	R. Philip Clark.....	Kingston.....	Φ Γ Δ House
s	Winfred MacBain Corbin.....	Binghamton.....	Σ Φ Place
ls	C. Roscoe Failing.....	Palatine Bridge.....	M. S. S. C.
s	John William Faust.....	Schenectady.....	19 Jay St.
e	Raymond J. Finch.....	Alpine.....	M. S. N. C.
e	Leon Burhaus Foote.....	Whitehall.....	Φ Γ Δ House
e	Harry Burton Furnside.....	Schenectady.....	B Θ Π House
s	Doane Sinclair Guardenier....	East Springfield.....	Φ Δ Θ House
s	Harry D. Hanford.....	Unadilla.....	M. S. N. C.
e	Edward Everett Harkness....	Harkness.....	M. S. S. C.
e	Stephen Howland.....	Berlin, Germany.....	N. S. N. C.
e	Frank Everett Huntington....	Keuka.....	North Colonnade
e	Raymond M. Jolley.....	South Bethlehem.....	Δ Φ House
e	Emil Kiessling.....	New York City.....	M. S. N. C.
e	Henry Edward Lewis.....	Ballston Spa.....	Ψ T House
c	Roy Hamilton McCormack....	Delmar.....	S. S. S. C.
e	John Joseph McCormick, Jr....	Troy.....	Δ T House
e	Cromwell McIntosh.....	Buffalo.....	K A Lodge
s	Charles Lawrence Mead.....	S. Ste. Marie, Mich..	A Δ Φ House
ls	Ward Winthrop Millias.....	Castleton-on-Hudson...	M. S. S. C.
c	Elmer Wallace K. Mould.....	Green Island.....	8 Eagle St.
e	J. Elliott Parry.....	Glens Falls.....	K A Lodge
e	Howard Sylvester Parsons....	Ossining.....	Δ T House
s	Jonathan Pearson.....	Hudson.....	713 Union St.
e	Leo H. Perry.....	Herkimer.....	Φ Γ Δ House
e	Fred Wilbur Pettit.....	Avoca.....	Φ Δ Θ House

<i>e</i>	Cedric Potter.....	<i>Omaha, Neb</i> .....	X Ψ Lodge
<i>s</i>	Chester Leland Rankin.....	<i>Schenectady</i> .....	1202 State St.
<i>s</i>	Daniel Tobias Read.....	<i>Monck's Cors., S. C.</i>	B Θ II House
<i>e</i>	Edwin Hazelett Robinson.....	<i>Watervliet</i> .....	1512 3rd Ave., Water't
<i>e</i>	William Clement Robinson.....	<i>Watervliet</i> .....	1512 3rd Ave., Water't
<i>e</i>	George W. Roosa.....	<i>Buffalo</i> .....	Δ T House
<i>e</i>	Harry A. Schaupp.....	<i>Albany</i> .....	Ψ T House
<i>e</i>	Herbert Davis Schutt.....	<i>Schenectady</i> .....	148 Glenwood Blv'd
<i>e</i>	Pierre J. Simkins.....	<i>Amsterdam</i> .....	Φ Γ Δ House
<i>e</i>	Harold Ernest Starbuck.....	<i>Gouverneur</i> .....	B Θ II House
<i>e</i>	Arthur J. Streibert.....	<i>Albany</i> .....	Δ T House
<i>e</i>	Frank M. Stewart.....	<i>Binghamton</i> .....	Ψ T House
<i>e</i>	Ralph Henry Tapscott.....	<i>Brooklyn</i> .....	A Δ Φ House
<i>ls</i>	Alvin Ury.....	<i>Schenectady</i> .....	143½ Barrett St.
<i>ls</i>	Ralph J. Ury.....	<i>Schenectady</i> .....	143½ Barrett St.
<i>c</i>	Carl Wachter.....	<i>Green Island</i> .....	313 Brandywine Ave.
<i>s</i>	Otto Jean Walrath.....	<i>Gloversville</i> .....	M. S. N. C.
<i>e</i>	J. Leslie Walton.....	<i>Schenectady</i> .....	1234 Union St.
<i>c</i>	James Bell Welles.....	<i>Geneseo</i> .....	Δ Φ House
<i>e</i>	Ernest Macmillan Wilson.....	<i>Hebron</i> .....	N. S. N. C.

Juniors—56

### Sophomores, Class of 1910

<i>s</i>	William A. Ackroyd.....	<i>Albany</i> .....	306 Clinton Ave., Albany
<i>e</i>	William Joseph Anderson.....	<i>Glens Falls</i> .....	N. S. N. C.
<i>ls</i>	Roland Miller Bartlett.....	<i>Glendale, Mass</i> .....	N. S. N. C.
<i>e</i>	Walter J. Becker.....	<i>Altamont</i> .....	147 Nott Terrace
<i>e</i>	Raymond S. Bennett.....	<i>Schenevus</i> .....	N. S. N. C.

- e* John Hammond Bovier.....*Elmira*.....M. S. S. C.  
*s* Perley Henry Buck.....*Schenectady*.....11 No. College St.  
*s* Albert Edward Carmichael....*Schenectady*.....201 Union St.  
*c* Samuel McCrea Cavert.....*Schenectady*.....29 Furman St.  
*ls* William Lane Cavert.....*Schenectady*.....29 Furman St.  
*c* Arthur Russell Chaffee.....*Morristown*.....Silliman Hall  
*e* John G. Charest.....*Schenectady*.....12 Barrett St.  
*s* Kennedy Conklin.....*New York City*.....X Ψ Lodge  
*s* Harry Gabriel Coplon.....*Troy*.....605 So. Centre St.  
*e* Archibald R. Dennis.....*Kalamazoo, Mich.*...A Δ Φ House  
*e* George A. Dillinger.....*Nuernberg, Germany*...S. S. N. C.  
*e* Raymond C. Dillingham.....*Denver, Colo.*.....X Ψ Lodge  
*e* Harley Dunbar.....*Gloversville*.....Δ Φ House  
*s* William Ferguson.....*Oneida*.....Ψ T House  
*e* Oscar S. Fernandez.....*East Chatham*.....707 South Ave.  
*e* J. Stuart Freeman.....*Schenectady*.....126 Park Ave.  
*e* Harlan Haviland Grover.....*Glens Falls*.....Δ T House  
*e* Macy Orsen Hallock.....*Rochester*.....B Θ Π House  
*e* Louis Albert Hequembourg....*Schenectady*.....22 Gillespie St.  
*e* Adam John Horn.....*St. Johnsville*.....N. S. N. C.  
*s* J. Mason Hotchkiss.....*Schenectady*.....70 Union Ave.  
*s* Horace King Hutchens.....*Pulaski*.....A Δ Φ House  
*e* Strickland K. Hyde.....*Hackensack, N. J.*...A Δ Φ House  
*ls* Edward B. Irish.....*Schenectady*.....1 Ontario St.  
*e* Will T. Keller.....*Portville*.....M. S. N. C.  
*e* Stephen D. Kelley.....*Saratoga Springs*....B Θ Π House  
*e* Andrew Vincent Kelly.....*Albany*...28 Jefferson St., Albany  
*e* Arnold Edward Kriegsmann...*Schenectady*.....18 Nott Terrace

s	William H. Ladue.....	Plattsburg.....	B Θ Π House
e	Charles Fitch Landsheft.....	Buffalo.....	Φ Δ Θ House
c	Harold A. Lent.....	Highland.....	Φ Δ Θ House
e	Harry MacConnell Leon.....	Little Falls.....	Ψ τ House
e	Eben Joseph Long.....	Youngs.....	783 Nott St.
s	Howard Macomber.....	Delanson.....	Delanson
e	Nelson S. Malta.....	Sao Paulo, Brazil..	P. O. Box 523
e	John J. McManus.....	Albany.....	480 Hudson Ave., Albany
e	William B. Neilson, Jr.....	Mechanicville.....	Δ Φ House
e	Leroy Coon Nimmo.....	Los Angeles, Cal.....	Φ Γ Δ House
c	Roscoe Almond Paul.....	Richmondville.....	424 Liberty St.
e	William Edward Paul.....	Richmondville.....	424 Liberty St.
ls	Leo B. Pearsall.....	Sodus.....	Δ τ House
s	Arthur Cuthbert Potter.....	Omaha, Neb.....	X Ψ Lodge
e	Edward Delavan Ransom.....	Albany.....	A Δ Φ House
e	Lloyd Nash Robinson.....	Lockport.....	Δ τ House
e	Harold E. Scheper.....	Beaufort, S. C.....	M. S. N. C.
e	Harold E. Seamans.....	Marathon.....	Φ Δ Θ House
e	Richard Parsons Sears.....	Buffalo.....	A Δ Φ House
e	Raymond Seem.....	Elmira.....	M. S. S. C.
e	Robert Blanchard Shepard.....	Hudson.....	A Δ Φ House
e	Aaron H. Sherman.....	Albany.....	149 So. Pearl St., Albany
e	Newton Waldron Slutter.....	West Seneca.....	Σ Φ Place
e	Carson Edwards Smith.....	Herkimer.....	Ψ τ House
s	Henry P. Stewart.....	Bath.....	X Ψ Lodge
e	Harry K. V. Tompkins.....	La Salle.....	Δ Φ House
c	Harry G. Van Deusen.....	Cooperstown.....	Φ Δ Θ House
s	Horace E. Vedder.....	Schenectady.....	107 Union St.



<i>e</i>	Joseph B. Vidal, Jr.....	<i>Sao Paulo, Brazil</i> ...	P. O. Box 65
<i>c</i>	Theodore Demarest Walser....	<i>Cohoes</i> .....	Α Δ Φ House
<i>e</i>	Edmund Brown Whitcomb....	<i>Holyoke, Mass.</i> ...	South Colonnade
<i>e</i>	Henry Edward Whiteside.....	<i>South Cambridge</i> ....	Φ Δ Θ House
<i>e</i>	Peter J. Whitmore.....	<i>W. Coxsackie</i> ...	147 Nott Terrace
<i>e</i>	John King Wilbur.....	<i>Buffalo</i> .....	Δ T House
<i>e</i>	William DeWitt Zielley.....	<i>Avoca</i> .....	M. S. S. C.
<i>e</i>	Judson Zimmer.....	<i>Gloversville</i> .....	Δ Φ House

Sophomores—69

### Freshmen, Class of 1911

<i>c</i>	George Norman Albree.....	<i>Swampscott, Mass.</i> ....	X Ψ Lodge
<i>e</i>	Anderson Allyn.....	<i>Holyoke, Mass.</i> .....	Δ T House
<i>e</i>	Charles Gorsch Atkin.....	<i>East Orange, N. J.</i> ...	B Θ II House
<i>c</i>	Herbert Soley Bain.....	<i>Rock City Falls</i> .....	S. S. S. C.
<i>e</i>	George B. Baker.....	<i>Yonkers</i> .....	783 Nott St.
<i>e</i>	Harold Wallace Baker.....	<i>Oneida</i> .....	Ψ T House
<i>ls</i>	John Beakley.....	<i>Johnstown</i> .....	N. S. N. C.
<i>e</i>	Louis Ray Bennett.....	<i>Howard</i> .....	N. S. N. C.
<i>e</i>	Laurence William Bentley....	<i>Elmira</i> .....	783 Nott St.
<i>e</i>	Thomas James Berry.....	<i>Elmira</i> .....	Ψ T House
<i>ls</i>	Harold Eugene Blodgett.....	<i>Schenectady</i> ....	444 McClellan St.
<i>e</i>	Franklin J. Bowman.....	<i>St. Johnsville</i> .....	Δ T House
<i>e</i>	Madison Edward Brainerd....	<i>Albany</i> .....	K A Lodge
<i>e</i>	Edward Henry Branson.....	<i>Coatesville, Pa.</i> ...	809 University Pl.
<i>c</i>	Michael William Bray.....	<i>Churubusco</i> .....	9 Romeyn St.
<i>e</i>	Arthur Doran Brown.....	<i>Ogdensburg</i> .....	Α Δ Φ House
<i>e</i>	Herman Fred W. Brumm.....	<i>Tonawanda</i> .....	Stop 4, State St.



<i>e</i>	Charles Edgar Burton.....	<i>New York City</i> .....	Φ Γ Δ House
<i>e</i>	Charles Milton Canfield.....	<i>East Orange, N. J.</i> ....	B Θ Π House
<i>c</i>	Walter Dudley Cavert.....	<i>Schenectady</i> .....	29 Furman St.
<i>e</i>	Harold Haskin Chadwick.....	<i>St. Albans, Vt.</i> .....	Σ. Φ Place
<i>ls</i>	Garrett Marcellus Clowe.....	<i>Schenectady</i> .....	613 Union St.
<i>c</i>	Tristram Coffin.....	<i>Hudson</i> .....	K A Lodge
<i>ls</i>	Harry Arthur Cohen.....	<i>Schenectady</i> .....	119 State St.
<i>e</i>	Earl K. Dewey.....	<i>Adams</i> .....	222 Nott Terrace
<i>e</i>	Walter R. H. Dick.....	<i>Schenectady</i> .....	1 Avenue B
<i>e</i>	Charles F. Duchscherer.....	<i>Buffalo</i> .....	M. S. N. C.
<i>s</i>	T. Gillespie Dunn.....	<i>Hadley</i> .....	Φ Δ Θ House
<i>e</i>	Harry F. Eagan.....	<i>Schenectady</i> .....	937 State St.
<i>ls</i>	Otto Alois Faust.....	<i>Schenectady</i> .....	19 Jay St.
<i>e</i>	George Merchant Fowler.....	<i>Buffalo</i> .....	Δ Υ House
<i>e</i>	Harold Jesse Goodman.....	<i>Albion</i> .....	26 Park Place
<i>e</i>	John Francis Gorman.....	<i>Clinton</i> .....	Φ Δ Θ House
<i>s</i>	Bernard A. Gray.....	<i>Black River</i> .....	N. S. N. C.
<i>c</i>	Leo Augustine Hanigan.....	<i>Schenectady</i> .....	938 State St.
<i>e</i>	William Andrews Hardenbergh.....	<i>White Sulphur Sp'gs.</i> ...	Δ Υ House
<i>c</i>	Daniel Joseph Hawkins.....	<i>Elmira</i> .....	S. S. N. C.
<i>e</i>	Everett Keeler Hawley.....	<i>Hartford, Conn.</i> .....	X Ψ Lodge
<i>e</i>	Walter Sinn Hoyt.....	<i>Monterey, Mass.</i> .....	A Δ Φ House
<i>e</i>	Bert Martin Hubbard.....	<i>Greenwich</i> .....	204 Hulett St.
<i>e</i>	Charles Sheldon Hubbard.....	<i>Bay Shore L. I.</i> .....	K A Lodge
<i>e</i>	John S. Hunter.....	<i>Willimantic, Conn.</i> ...	Φ Δ Θ House
<i>e</i>	Gustave Huthsteiner.....	<i>Schenectady</i> .....	120 Park Ave.
<i>s</i>	Hans Huthsteiner.....	<i>Schenectady</i> .....	120 Park Ave.
<i>e</i>	Neil Dutton Hyde.....	<i>Afton</i> .....	Wanmer St.

e	Theodore Schuyler Ingham.....	Little Falls.....	Σ Φ Place
s	Henry Berger Keckelely.....	Charleston, S. C.....	Σ Φ Place
e	Charles Frederick Kniskern.....	Central Bridge.....	751 Nott St.
s	Edward Baldwin Lefferts.....	Council Bluffs, Ia.....	X Ψ Lodge
e	Willis C. Lincoln.....	Schenectady.....	606 Hamilton St.
ls	Charles Frederick MacGill, Jr....	Pittsfield, Mass.....	A Δ Φ House
e	Manly Leonard Mackey.....	Cobleskill.....	32 Furman St.
e	Rufus B. McConnell.....	Buffalo.....	103 Nott Terrace
c	Ransom Rathbone Micks.....	Seneca Falls.....	A Δ Φ House
e	Stanley Congdon Miller.....	Elmira.....	X Ψ Lodge
s	Charles Inslee Mohair.....	Newton, N. J.....	M. S. N. C.
e	Harold Wheeler Morss.....	Albany... 1550 Lake Ave., Albany	
ls	Edward J. O'Connell.....	Albany... 379 So. Pearl St., Albany	
s	John Bancroft Odell.....	Schenectady... 49 Parkwood Blv'd	
e	George Orr.....	Gloversville.....	633 Terrace Place
s	Frank Sidney Ostrander.....	Schenectady... 13 University Pl.	
e	Allen Adams Patterson.....	Glens Falls.....	M. S. N. C.
e	Paul Clayton Raymond.....	Buffalo.....	A Δ Φ House
s	Harry S. Reynolds.....	Schenectady.....	12 Gillespie St.
e	A. Gaylord Riggs.....	Elmira.....	Ψ T House
e	Edgar John Simmons.....	Glens Falls.....	K A Lodge
e	States Van Loon Smith.....	Englewood, N. J.....	Φ Δ Θ House
e	Walter Curtis Smith.....	Lynchburg, Va.... 108 Park Place	
e	John Trowbridge St. John.....	Binghamton.....	Σ Φ Place
e	Howard Olwin Thorne.....	Yonkers.....	X Ψ Lodge
e	Martin Arthur Tobin, Jr.....	Port Henry.....	M. S. N. C.
e	John A. Hyde Torry.....	Cooperstown.....	Σ Φ Place
e	Tulloch M. Townsend.....	Phelps.....	303 Seward Pl.

<i>e</i>	S. Vernon Travis.....	<i>Hale Eddy</i> .....	S. S. S. C.
<i>els</i>	Jacob H. Van Aernam.....	<i>Altamont</i> .....	Φ Δ Θ House
<i>e</i>	Fremont L. VanPatten.....	<i>Duanesburg</i> .....	Duanesburg
<i>ls</i>	George Bissell Verbeck.....	<i>Ballston Spa</i> .....	X Ψ Lodge
<i>s</i>	Arthur Henry Vines.....	<i>Holyoke, Mass</i> .....	N. S. N. C.
<i>e</i>	Chester M. Wallace.....	<i>Clinton</i> .....	Φ Δ Θ House
<i>e</i>	George B. Weaver.....	<i>Loudonville</i> .....	Δ T House
<i>e</i>	Ralph Austen Webb.....	<i>Mille Roches, Ont., Can.</i>	N. S. N. C.
<i>e</i>	Fred Babcock Wilbur.....	<i>Adams</i> .....	222 Nott Terrace
<i>ls</i>	Roger Tryon Wilcox.....	<i>Westfield, N. J.</i> .....	A Δ Φ House
<i>e</i>	Harold R. Winkemeier.....	<i>Brooklyn</i> .....	Ψ T House
<i>e</i>	Charles Leland Wood.....	<i>Herkimer</i> .....	303 Lenox Road
<i>e</i>	John Smith Woodward.....	<i>Warrensburg</i> .....	Δ Φ House
<i>e</i>	Frank Wallace Yates.....	<i>Fort Edward</i> .....	134 Park Place

Freshmen—87

### Summary of Students, Union College

Candidates for the Degree of Master of Arts.....	6
Graduate Student.....	1
Seniors.....	51
Juniors.....	56
Sophomores.....	69
Freshmen.....	87
Total.....	<u>270</u>

## STUDENTS OF THE ALBANY MEDICAL COLLEGE

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### Fourth Year Class

Earl Erret Babcock.....	Deer River
Frederick J. Barnet.....	Albany
William Edward Barth.....	Schaghticoke
John Adkins Battin.....	Watervliet
Hartley Edward Boorum.....	Interlaken
Samuel Pierson Brush.....	Troy
Eugene Howard Burnes.....	Amsterdam
William Henry Conger, Jr.....	Delmar
Joseph Davis.....	High Falls
James William Fleming.....	Little Falls
Nelson Kaufman Fromm, A. B.....	Albany
Earl William Fuller.....	Utica
Frank Garten.....	Albany
John Rouse Gillett, A. B.....	Albany
Edwin Francis Hagedorn.....	Gloversville
Rosslyn Philip Harris.....	Delanson
Stanton Perry Hull.....	Berlin
Jacob Travers Krause.....	Schenectady
Alexander Mitchell Loewenstein.....	Troy
John Joseph Aloysius Lyons, Ph. G.....	Albany
Robert Daniel Manning.....	Mohawk
Charles Gibson McGaffin, Ph. B.....	Cohoes

George Bolton McMurray.....	Troy
Robert Copeland Mooney.....	Gloversville
William Leslie Munson.....	Granville
John Paul O'Keeffe.....	Hadley
Charles Bates Phillips.....	Gloversville
George Philo Pitkin.....	Schroon Lake
Milton Woolley Platt.....	Albany
John Joseph Rainey.....	Troy
Edward John Riley.....	Rensselaer
Bert William Roy, A. B.....	Clyde
George Stephen Silliman, A. B.....	Stockport
Ray Ernest Smith.....	Rutland, Vt.
Aaron Sobel.....	Newburgh
Herbert Edgar Sperry.....	Penfield
William James Thomson.....	Oneonta
Edward Everett Tredway, A. B.....	Gloversville
Arthur Ernest Were.....	Albany
Joseph Edward Windbiel.....	Amsterdam
John Wingate.....	Princetown
Paul Virgil Winslow.....	Warwick

Fourth Year Students—42

### Third Year Class

Edward Johnson Abbott, A. B.....	Albany
Morris Bellin.....	Albany
William Arthur Bing.....	Castleton
Lewis Webster Burdick, B. S.....	Maryland

William Francis Conway.....	Albany
William Henderson Davidson, A. B., Pd. B.....	Cohoes
Edward Daniel Donohue.....	Glens Falls
Harry Houghton Drake.....	Albany
Orla Andrew Druce.....	Fulton
Wakeman Clark Egerton, A. B.....	Albany
Gilbert Charles Fisk.....	Albany
Henry Blacklidge Gillen.....	Cohoes
William Breese Gillespie.....	Saranac Lake
Elwin Wallace Hannock.....	Saratoga Spa
Eddy Sterns Haswell.....	Albany
Harley Heath.....	Warrensburg
Thomas Milton Holmes, B. S.....	Albany
Ellis Kellert.....	Albany
Robert Schofield Long.....	Frankford, Del.
William Thomas Manion.....	Waterford
Eugene Francis McGillian.....	Green Island
James Gibbons McGillicuddy.....	Glens Falls
Thomas Andrew McGrath.....	Hoosick Falls
Burlin George McKillip.....	Oliverea
Frederick William McSorley.....	Malone
Edward Raymond Messer.....	Pittsfield, Mass.
Alexander Francis Mosher.....	Glens Falls
Neil Bertram Palen.....	Albany
Arthur Emerson Pitts.....	Cohoes
Augustus Charles Post.....	Catskill
William Rufus Rathbun.....	East Springfield

Clarence Leonard Russell.....	Deposit
Charles Emerson Slater.....	Cairo
Frederick Eugene Vaughan.....	Gloversville
Charles James Vielley.....	Cortland
Walter Harry Waterbury.....	East Nassau
Calvin Bassler Witter.....	Albany
James Joseph York.....	Watervliet

Third Year Students—38

### Second Year Class

William David Aldrich.....	Wevertown
William Dewey Allen.....	Rensselaer
Wardner Daniel Ayer.....	Rensselaer
John Frederick Beiermeister.....	Troy
Le Roy Herbert Bender.....	Utica
George Bibby.....	Pottersville
Claude Bledsoe.....	Gloversville
Cornelius Joseph Buckley, A. B.....	Pittsfield, Mass.
John Bennett Burke.....	Troy
James Whitfield Byrne.....	Troy
Frank Gibson Calder.....	Freehold
Eugene Francis Connally.....	Troy
Arthur George Cook.....	Gloversville
John Richard Devine.....	Troy
George Watson Dufty.....	Troy
John Arthur Farrell, Jr.....	Rensselaer
Richard Berchmans Gray.....	Rensselaer



Henry Martin Grogan.....	Warrensburg
Philip Conrad Hacker.....	Albany
Matthew Dominic Harris.....	Ilion
James Charles Hassall.....	Troy
Patrick Joseph Hirst.....	Mechanicville
William Knowlton Johnson.....	Schodack Landing
Walter Scott Lilienthal.....	Albany
Walter Edward Lundblad.....	Schenectady
Harold McDonald.....	Watervliet
Edward Bartholomew Manion.....	Herkimer
Roy Jay Marshall.....	Gouverneur
William Henry Mason.....	Gloversville
John Thomas McGivern.....	Castleton
John James McShane.....	Springfield Center
Howard Casper Murray.....	Herkimer
Charles Frederick Myers.....	Saratoga
Abraham Lewis Olshansky.....	Albany
Chauncey Butler Packard.....	Troy
George Bradford Randall.....	Ballston Spa
Willard Tipple Rivenburgh.....	Ghent
Leander George Rymph.....	Port Ewen
S. Joseph Selkin.....	Albany
William Thomas Shields, Jr.....	Albany
John Forrest Southwell.....	Keene, N. H.
John Albert Sullivan.....	Pittsfield, Mass.
L. George Swoprenont.....	Cohoes
Harold Augustus Traynor.....	Brushton

Harry Franklin Van Loon.....	Albany
Arthur Hastings Wheeler.....	Troy
John Edmund White.....	Philmont
Second Year Students—47	

### First Year Class

Antonio Martinez Alvarez.....	San Juan, Porto Rico
William Benedict Anderson.....	Troy
La Verne Adelbert Bouton.....	Fultonville
Milton Sardner Burch.....	North Adams, Mass.
Michael Ercole De Luca.....	Troy
Ray Manier Eaton.....	North Adams, Mass.
Percy Henry Finch.....	Broadalbin
William Arthur Flood.....	North Bennington, Vt.
Walter Clayton Fox.....	Troy
Samuel Friedman.....	Schenectady
Frederick Joseph Garlick.....	Fall River, Mass.
Bertram Wesley Gefford.....	Masonville
Clayton Longueville Gifford.....	Valley Falls
James Joseph Hart.....	Albany
Charles Hynes.....	Troy
Irwin Johnson.....	Watervliet
William Neely Keith.....	Newtown, Pa.
Ernest Louis King.....	Ticonderoga
Frederick Louis Kreicher.....	Troy
Charles Immanuel Loeble.....	Troy
Harold Arthur Lucas.....	Rensselaer

Charles Edward Maxwell.....	Saratoga Spa
William Edward McCormick.....	Albany
John Ashley McElwain.....	Cohoes
Walter Daniel McKenna.....	Troy
Joseph Ambrose McPhillips.....	The Glen
Horace Clifford Montgomery.....	Waddington
Henry Joseph Noerling.....	Albany
Edmond Joseph O'Donnell.....	New York
Martin Joseph O'Hearn.....	Saratoga Springs
Ralph Baker Post.....	Catskill
Peter Francis Purcell.....	Salem
Francis Bernard Quinlan.....	Glens Falls
William Francis Rafferty.....	Rensselaer
Hiram Burdette Riggs.....	Canajoharie
S. Booth Schleiermacher.....	East Branch
Emil John Senn.....	Schenectady
William James Sweeney.....	Newburg
Reynolds King Townsend.....	Albany
William Trotter.....	Troy
Arthur Eddy Wells.....	Schenectady
Frank Mathias Wenendorf.....	Albany
Jerry West.....	Gallupville
Ira Condict Whitehead.....	Albany
Ernest Leroy Wilson.....	Schroon Lake
Melvin Thomas Woodehead.....	Amsterdam

## STUDENTS OF THE ALBANY LAW SCHOOL

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Seniors

R. Martinez Alvarez (Spanish Inst.).....	San Juan, P. R.
John O. Bates.....	Albany
William F. Bell (Union).....	East Worcester
Edward H. Bennett (Hamilton).....	Pulaski
Max Boyer.....	New London, Conn.
Edward Brody.....	New York City
Edward E. Brogan .....	Dansville
Henry M. Brown (Hobart).....	Adams
John W. Burrows.....	Harpersville
Charles L. Canton.....	Newtonville
Clark Cipperly .....	Troy
Philip L. Classen (Union).....	Albany
William T. Clute.....	Rensselaer
Joseph J. Coates.....	Albany
Seth T. Cole.....	Catskill
Charles E. J. Coyle.....	Albany
Harry Cook (Union).....	Albany
William Crangle .....	Fonda
Daniel F. Dunn .....	Troy
William A. Dunne.....	Troy
Malcolm R. Evers.....	Waterford
Ralph W. France.....	Windham
Harold E. Fritts (Colgate).....	Hudson

William Graf .....	Hudson
Roscoe Harper .....	Waddington
Frank Hunter (Cornell).....	Cornwall
Francis J. Hurley (St. Stephen's).....	Detroit, Mich.
Daniel F. Imrie (Union).....	Lake George
William D. Ingram.....	Ogdensburgh
Joel H. Jacobson (Syracuse University).....	Syracuse
Eli M. Jones.....	Elba
Denis J. Kilkenny.....	Oneonta
George M. LePine.....	Unadilla
Claude H. Leyfield.....	Schaghticoke
J. Harris Loucks.....	Feura Bush
John A. Maloney (University of Penn.).....	Leroy
Harry D. Marshall (Hobart).....	Geneva
Herrick McClenthen (Union).....	Jefferson
James R. McDonough (Fordham).....	Albany
James C. McMahon (Fordham).....	Port Henry
Raymond H. Moody.....	Binghamton
Leonard B. Moore.....	Fort Plain
Wendover Neefus (Cornell).....	Hudson
Merwin H. Nellis (Hamilton).....	Albany
William F. Newton.....	Geneseo
Harold P. Peckham (Williams).....	Cohoes
E. Stanley Pier.....	Oneonta
George Pomeroy .....	Clarksville
Paul E. Porter.....	Theresa
Floyd W. Powell.....	Kingston

James F. Riley.....	Hudson
John H. Ring.....	Cohoes
Gladys M. Rosbrook.....	Albany
Edward F. Ronan.....	Binghamton
Charles P. Stewart.....	Kingston
Frank H. Stephens.....	Albany
Glen A. Stockwell.....	Lockport
Granville D. Stubbs.....	Danbury
William E. Thorpe.....	Catskill
Fred A. Torrance (Colgate).....	Jay
William R. Van Campen.....	Wellsville
Charles R. Watson.....	Binghamton
Townsend K. Wellington (Williams).....	Troy
Walter F. Wellman (Union).....	Schenectady
Frank M. Wilcox.....	Arctic, R. I.

Seniors—65.

### Juniors

Raymond E. Aldrich.....	Poughkeepsie
Caro Tracy Arnold.....	Albany
Nicholas J. Barry, Jr.....	Albany
Alexander Bills .....	Chatham
Charles J. Blakeslee.....	Binghamton
Marie K. Brennen.....	Hudson
Cyrus M. Briggs (Union).....	Schenectady
Homer D. Brockett (Colgate).....	Bouckville
Beecher J. Burton.....	Lake George
Henry Bush .....	Horseheads

R. S. Cockran.....	Miami, Florida
Charles H. Coyle.....	Chestertown
Jeremiah W. Davern.....	Peru
Dennis S. Dawson.....	Cohoes
Ward DeSilva.....	Arena
John T. Donlin.....	Ilion
Peter A. Douglas (Colgate).....	Schenectady
John R. Earl, Jr.....	Lockport
George M. Fayles.....	Troy
Wilbur D. Finch.....	Alpine
James S. Flanagan.....	Norwich
J. Sidney Forsyth.....	Watervliet
Morris I. Franklin (American College).....	Albany
John M. Gauntlett (Cornell).....	Ithaca
William Goldberg .....	Albany
Appleton Gregory .....	Albany
Edward J. Halligan.....	Troy
William V. Haviland.....	Sandy Hill
Earl Hawley .....	Poughkeepsie
Richard T. Hayes.....	Keeseville
Dudley F. Hill (Union).....	Schenectady
Robert T. Hume (Syracuse University).....	Walden
William L. Hunt.....	Killawog
Henry M. James.....	Hudson
George F. Kelsey.....	Olean
Raymond C. Martin.....	Albany
William C. Maynard (Wesleyan University).....	Hartford



William M. Miller.....	Schenectady
Charles S. Motisher.....	Albany
Frederick Mueller .....	Albany
James F. O'Brien (Manhattan).....	Troy
Francis O'Connor.....	Wellsville
Robert B. Pierce.....	Albany
Kauzer Pos (Robert College).....	Albany
J. V. Purcell.....	Albany
John Raines, 3rd.....	Canandaigua
J. Gordon Roper.....	Mishawaka, Ind.
Emmet H. Ross.....	Jamestown
Jose Sabater.....	Mayaguez, Porto Rico
S. Louis Schnitzer.....	Albany
C. Fred Schwarz.....	Troy
John J. Scully.....	Rensselaer
John C. Tracy (Cornell).....	Hudson
Elmer J. Vincent.....	Malone
Sherman C. Ward.....	Rochester
Edward I. Welti.....	Schenectady
William K. Wood.....	Schenectady
George H. Zwick.....	Albany

Juniors—58.

## STUDENTS OF THE ALBANY COLLEGE OF PHARMACY

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### Senior Class

Joseph Augustus Babcock.....	Greenwich, N. Y.
John Nathan Bolt.....	Unadilla
William Richard Bradley.....	Albany
Clyde Frederick Brandy.....	Ogdensburg
Henry Milliner Brown.....	Plattsburg
Charles Austin Buchanan.....	Amsterdam
George William Caldwell.....	Lake George
Charles Richard Carey.....	Stockbridge, Mass.
George Michael Carney.....	Ilion
Stephen Emery Cook.....	Albany
Gordon Alfred Fitch.....	Thompson, Mich.
Arthur Martin Frink.....	Gloversville
Clifford Adelbert Hewitt.....	Hoosick Falls
Walter John Joseph Hope.....	Schenectady
Leon Augustus Lines.....	Homer
Albert James McCaffrey.....	Nicolet, P. Q., Canada
George Walling McElroy.....	Albany
Beulah Ruth Norton.....	Fair Haven, Vt.
Aimee Hollett Palmatier.....	Albany
John Clair Parker.....	Deposit
William Morrissey Pratt.....	Albany
Daniel Ford Rasbach.....	Mohawk

Rocco Spina .....	Utica
Harley Richard Streeter.....	Fair Haven, Vt.
James Charles Thornton.....	Marcellus
Worden Joseph Thyne.....	Broadalbin
Milford Eugene Frost.....	Troy
Eugene Wheelock Veeder, Jr.....	Schenectady
Frank S. Visscher.....	Troy
Charles Earl Weidman.....	Marcellus
Ernest Warren Wells.....	Scotia
Henry Jacob Wildhack.....	Utica
Erford Lloyd Wood.....	Delhi

Seniors—33

### Junior Class

Gracia Naomi Anscombe.....	Saratoga Springs
Roy Irving Bander.....	Johnstown
Michael Joseph Breman.....	Waterbury, Conn.
Anna Lucia Caldwell.....	Hagaman
Charles Edgar Collins.....	Johnstown
Walter Cook.....	Troy
George V. Daily.....	Plattsburg
Anna Irene Duffy.....	Troy
Harold Scherer Eggers.....	Cohoes
Edward Bernard Finn.....	Sandy Hill
Daniel Cornelius Fitzgerald.....	Glens Falls
William Walker Gibson.....	Albany
Arthur Lynn Goldsmith.....	Oneonta
Paul August Hespelt.....	Johnstown

Francis Augustus Keenan.....	Albany
Thomas Ernest Lee.....	Broadalbin
George Ivan Lockwood.....	Penn Yan
Le Roy George Matthews.....	Catskill
Charles Frank Mohan.....	Troy
William James Murphy.....	Fulton
Harry Sumner Noël.....	Williamstown, Mass.
Logan Kniffin Palmatier.....	Albany
James Louis Roark.....	St. Johnsville
Grover Buell Sanford.....	Arkville
Elsie Emma Sautter.....	Albany
Charles William Thompson.....	Bennington, Vt.
Raymond Ford Wasserback.....	Albany
Clarence Robert Whitaker.....	Albany
Juniors—28	

## SUMMARY OF STUDENTS, UNION UNIVERSITY

Union College.....	270
Albany Medical College.....	173
Albany Law School.....	123
Albany College of Pharmacy.....	61
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Total.....	627
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UNION COLLEGE  
SCHENECTADY, NEW YORK

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ACADEMIC DEPARTMENT OF  
UNION UNIVERSITY

UNION COLLEGE

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Union College was incorporated by the Regents of the University of the State of New York on the 25th day of February, 1795. It was the second college incorporated in the State, and the first north of the city of New York and west of the Hudson River. It received its name from the circumstance that several religious denominations co-operated in its organization, and was the first college in the United States which was not of a strictly denominational character. It has continued from its foundation to be a representative institution of Christian unity.

The first president of Union College was the Rev. John Blair Smith, of Philadelphia. He was elected in 1795, and resigned in 1799, only a few months before his death. He was succeeded by Jonathan Edwards, the younger, who died in 1801. The Rev. Jonathan Maxcy, previously president of Brown University, succeeded Dr. Edwards, and resigned at the end of two years. In 1804 the Rev. Eliphalet Nott was elected president of Union College, which office he held until his death, on the 29th day of January, 1866. The Rev. Laurens P. Hickok, a graduate of the College, who had long acted as vice-president, was elected his successor. He resigned in 1868. The Rev. Charles A. Aiken succeeded Dr. Hickok in 1869, and resigned in 1871. The Rev. Eliphalet Nott Potter was elected president in 1871, and inaugurated June 20, 1872. On his resignation, in 1884, the Hon. Judson S. Landon was appointed president *ad interim*, and served until the inauguration of Harrison E. Webster, who was elected president May 23, 1888, and inaugurated June 26, 1888. On his resignation, in January, 1894, Rev. Andrew V. V. Raymond was elected president, and inaugurated in June, 1894. Dr. Raymond resigned July 18, 1907, and the Rev. George Alexander was appointed president *ad interim*.

## TRUSTEES OF UNION COLLEGE

- Ex-Officio. { HIS EXCELLENCY CHARLES E. HUGHES, Governor  
 HON. LEWIS S. CHANLER, Lieutenant-Governor  
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- SILAS B. BROWNELL, LL. D., 71 Wall street, New York  
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 HON. EDWARD W. PAIGE, LL. D., 46 Cedar street, New York  
 HON. JOHN H. STARIN, Pier 18, N. R., New York  
 REV. GEORGE ALEXANDER, D. D., 10th street and University place, New York  
 HON. WARNER MILLER, LL. D., Herkimer  
 HON. NICHOLAS V. V. FRANCHOT, A. M., Olean  
 HON. GEORGE F. SEWARD, LL. D., 97 Cedar street, New York  
 EDWIN W. RICE, JR., PH. D., Sc. D., Schenectady  
 EDWARD P. WHITE, A. M. Buffalo  
 CHARLES E. SPRAGUE, PH. D., Union Dime Savings Bank, New York  
 EDGAR S. BARNEY, Sc. D., 36 Stuyvesant street, New York  
 WILLIAM F. HAVEMEYER, 32 Nassau street, New York  
 PROF. FRANKLIN H. GIDDINGS, LL. D., 150 West 79th street, New York  
 SEYMOUR VAN SANTVOORD, Troy, term of office expiring June, 1908  
 FREDERICK W. CAMERON, A. M., Albany, term of office expiring June, 1909  
 THOMAS WEIR, Salt Lake City, Utah, term of office expiring June, 1910  
 CHARLES B. McMURRAY, Troy, term of office expiring June, 1911



*UNION COLLEGE***President of the Board**

SILAS B. BROWNELL, LL. D.

**Treasurer**

FRANK BAILEY, A. B.

**Secretary**

EDWARD P. WHITE, A. M.

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**Instruction Committee**

REV. GEORGE ALEXANDER, D. D.

PROF. FRANKLIN H. GIDDINGS, LL. D.

EDWIN W. RICE, JR., PH. D., SC. D.

EDGAR S. BARNEY, PH. D.

## ALUMNI ASSOCIATIONS

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### General Alumni Association

*President*, Grenville M. Ingalsbe, '68; *Vice-President*, Rev. F. R. Marvin, '69; *Secretary*, Rev. W. N. P. Dailey, '84, Amsterdam; *Treasurer*, Marvin H. Strong, '96, 12 Union St., Schenectady

### Association of New York

*President*, Frederick W. Seward, LL. D., '49; *Vice-Presidents*, George F. Seward, LL. D., '60, and Charles E. Sprague, PH. D., '60; *Secretary*, Edgar S. Barney, Sc. D., '84, 36 Stuyvesant St., New York City; *Treasurer*, Clarence Johnson, '90, 17 Battery Place, New York City

### Association of Albany and North-Eastern New York

*President*, Hon. John M. Bailey, '61; *Vice-President*, Henry A. Van Alstyne, '93; *Secretary*, Robert M. Eames, '99, 54 Commercial Bank, Albany; *Treasurer*, Walter S. McEwan, '95, 461 Western Ave., Albany

### Association of Washington, D. C.

*President*, Hon. Joseph E. Ransdell, '82; *First Vice-President*, Timothy E. Wilcox, '61; *Second Vice-President*, Franklin P. Hough, '77; *Secretaries*, Norman E. Webster, Jr., '96, 1443 Monroe St., Washington, D. C., and Dann L. Wood, '97; *Treasurer*, Philip J. Ryan, '80, 1411 Massachusetts Ave., Washington, D. C.

### Association of New England

*President*, Theodore C. Hurd, '56; *Vice-President*, G. A. P. Godwise, A. M., '72; *Secretary*, Rev. Daniel D. Addison, D. D., '83, 2 Parkman Terrace, Brookline, Mass.; *Treasurer*, Frederick T. Rogers, M. D., '80, 117 Broad St., Providence, R. I.

### Association of the Genesee Valley

*President*, Stephen K. Williams, LL. D., '37; *Secretary* and *Treasurer*, James G. Greene, '84, 513 German Insurance Building, Rochester

### Association of the South

*President*, Rev. Charles S. Vedder, D. D., LL. D., '51, Charleston, S. C.; *Vice-President*, Archibald W. Ray, '83, Columbia, S. C.; *Secretary-Treasurer*, Prof. Charles J. Colcock, '75, Charleston, S. C.

### Association of the Northwest

*President* and *Secretary*, Henry C. Wood, '83, 420 The Rookery, Chicago, Ill.; *Vice-President*, Eugene K. Herrick, '68

### Association of Michigan

*President*, W. A. Waldron, '79; *Vice-President*, Charles D. Lawton, '58; *Secretary*, H. L. Crain, '02, 568 Second Ave., Detroit, Mich.; *Treasurer*, John Ickler, '80, Detroit

### Association of Western New York

*President*, Edward P. White, '79; *Vice-President*, Rev. H. R. Fancher, '81; *Treasurer*, Nelson M. Redfield, '87; *Secretary*, Rev. Frederick L. Greene, '99, Buffalo

### Alumni Record

The College desires to keep as full a record as possible of the residences, occupations and public services of its alumni. It also desires obituary matter. Information should be addressed to the Secretary of the Faculty, Union College, Schenectady, New York.

FACULTY

---

GEORGE ALEXANDER, D. D.

President ad interim

BENJAMIN H. RIPTON, PH. D., LL. D.

Dean and Professor of History and Sociology

WILLIAM WELLS, PH. D., LL. D.

Professor Emeritus of Modern Languages and Literature

SIDNEY G. ASHMORE, A. M., L. H. D.

Professor of the Latin Language and Literature

THOMAS W. WRIGHT, A. M., PH. D.

Professor Emeritus of Mathematics

FRANK S. HOFFMAN, A. M., PH. D.

Professor of Mental and Moral Philosophy

OLIN H. LANDRETH, A. M., C. E., SC. D.

Professor of Civil Engineering

JAMES H. STOLLER, A. M., PH. D.

Professor of Biology and Geology

EDWARD E. HALE, JR., PH. D.

Professor of the English Language and Literature

CHARLES P. STEINMETZ, A. M., PH. D.

Professor of Electrical Engineering

## UNION COLLEGE

JOHN I. BENNETT, A. B.

Professor of the Greek Language and Literature

HOWARD OPDYKE, A. B.

Professor of Physics

EDWARD ELLERY, A. M., PH. D.

Professor of Chemistry

FRANK COE BARNES, A. M., PH. D.

Professor of Modern Languages

HORACE GRANT MCKEAN, A. M.

Professor of Rhetoric and Public Speaking

JOHN LEWIS MARCH, A. M., PH. D.

Adjunct Professor of Modern Languages

ELMER E. F. CREIGHTON, B. S., E. E.\*

Assistant Professor of Electrical Engineering

CHARLES F. F. GARIS, PH. B.

Assistant Professor of Mathematics

JOHN W. HUGHES, B. S. in C. E.

Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. in E. E.

Assistant Professor of Electrical Engineering

DANIEL A. YOUNG, B. S. in C. E.

Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.

Instructor in Physical Culture

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\*Absent on leave.

JAMES H. CUNNINGHAM, B. E.  
Instructor in Electrical Engineering

MORLAND KING, B. E., M. E. E.  
Instructor in Electrical Engineering

CYRUS A. MELICK, C. E.  
Instructor in Civil Engineering

WILBERT A. GARRISON, A. M.  
Instructor in Engineering Mathematics

---

Instructor in Engineering Drawing

OSCAR VON VOIGTLANDER, M. E.  
Instructor in Civil Engineering.

DAVID HUTCHISON, A. M., B. D.  
Instructor in History

FRANK W. SMITH  
Instructor in Modern Languages

ALBERT S. EASTMAN, B. S.  
Assistant in Chemistry

DEWITT CLINTON  
Librarian

PUTNAM CADY, A. M., F. R. G. S.  
Lecturer

### Standing Committees of the Faculty

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EDUCATION—Professors Ripton, Ashmore, Hoffman, Landreth, Stoller, Hale, Steinmetz, Opdyke, Bennett, Barnes, March, Ellery, McKean, and Garis, Dr. McComber, and Instructor Garrison

LIBRARY—Professors Hale, Landreth, and Bennett, and the Librarian

CATALOGUE—Professors Barnes, Opdyke, and Hale

SCHOLARSHIPS—Professors Ripton, Bennett, and Ellery

STAGE APPOINTMENTS—Professors Hughes, McKean, and Ferguson

ATHLETICS—Professors Opdyke and Bennett, and Dr. McComber

ADMISSIONS—Professors Barnes, Ashmore, Ripton, Landreth, Hale, Opdyke, Bennett, March, and Garis, and Dr. McComber

ADMISSION TO ADVANCED STANDING—Professors Hale, Landreth, and Bennett

DISCIPLINE—Professors Ripton, Ashmore, Landreth, Hale, Bennett, March, and Opdyke

SCHEDULE—Professors Garis and March, and Instructor King

MUSIC—Professors Ellery, McKean, and Ferguson

PREPARATORY SCHOOLS—Professors Barnes, Ellery, and Garis, and Instructors Cunningham and King

EMPLOYMENT—Professors Stoller and McKean, and Instructor Cunningham

SENIOR CLASS—Professors Bennett, Ashmore, and Hughes

JUNIOR CLASS—Professors Ellery, Hoffman, and Ferguson

SOPHOMORE CLASS—Professors Opdyke and Stoller, and Instructor King

FRESHMAN CLASS—Professors Garis and March, and Instructor Cunningham



COLLEGE OFFICERS

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GEORGE ALEXANDER, D. D.

President ad interim

BENJAMIN H. RIPTON, PH. D., LL. D.

Dean

College Office

FRANK BAILEY, A. B.

Treasurer

175 Remsen St., Brooklyn

CHARLES B. POND

Assistant Treasurer

College Office

FRANK COE BARNES, PH. D.

Secretary of the Faculty

Room 1, Washburn Hall

JAMES H. STOLLER, PH. D.

Curator of the Museum

JENNIE I. MCKAIN

Recorder

DEWITT CLINTON

Librarian

STEWART A. MCCOMBER, M. D.

Director of Gymnasium

JOHN R. WALLING

Chief Engineer and Superintendent of Grounds and Buildings

## COURSES OF STUDY

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[For curriculum of the undergraduate courses for the year 1907-1908, see pages 105-109 and pages 174-183]

### 1. Courses leading to the degree of A. B.

COURSE A.—Greek, as indicated on p. 75, is required for admission to this course. Latin and Greek are required for two years, and are elective for the remainder of the course. French and German are included, in addition to the ancient languages.

COURSE B.—This course may be pursued by candidates who satisfy the requirements for admission to the Ph. B. course. Greek is begun on entrance and required for four years. In other respects Course B is virtually identical with Course A.

### 2. Course leading to the degree of Ph. B.

This course offers Latin without Greek, for which is substituted additional work in modern languages and Science.

### 3. Course leading to the degree of B. S.

This course is based upon the study of Mathematics and the Sciences, with extended work in English and other modern languages.

In courses 1, 2 and 3 the greater part of the work of the last two years is elective.

### 4. General Engineering course of four years leading to the degree of B. E.

This course offers the foundation of a broad Engineering Education, comprising Mathematics, the Sciences, the fundamental principles of the special branches of the profession, some training in History and Economics, a knowledge of

both French and German and a course in English. During the third and fourth years two alternative options are offered in this course:

*Option A.*—In which the fundamental principles of advanced technical subjects receive emphasis.

*Option B.*—In which studies are offered which lead to a training for engineering positions of an executive or administrative nature.

**5. General Engineering course of six years leading to the degrees of B. E. and Ph. B.**

This course combines the above four years Engineering courses No. 4, including both its options, with the Latin Scientific course, No. 2. The subjects of the two courses are interwoven throughout each term and the course thus offers in carefully arranged form a combined college and technical training.

**6. Sanitary Engineering course leading to the degree of B. E.**

This differs from course 4 in substituting special work in Sanitary Engineering for some of the General Engineering studies.

**7. Electrical Engineering course leading to the degree of B. E.**

This course is intended to give a broad and thorough Engineering education, with the specific instruction requisite for Electrical Engineering.

**8. Graduate course in General or in Sanitary Engineering leading to the degree of M. C. E.**

This course of one year's graduate study, consists of lectures, laboratory and research work, and is open to graduates

of the General or the Sanitary Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

**9. Graduate course in Electrical Engineering leading to the degree of M. E. E.**

This course of one year's graduate study consists of lectures, laboratory and research work, and is open to graduates of the Electrical Engineering course of Union College, or of any other institution of a standing recognized by the Faculty.

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Students having the profession of Medicine in view are permitted to take the first year studies of the Albany Medical College as a substitute for the studies of the first two terms of the Senior year in Union College. This enables medical students to lessen the time of their academic and professional studies by one year.

For tuition charges, see page 114.

## ADMISSION

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### General Conditions

The regular entrance examinations are held on the Thursday and Friday immediately following Commencement, and on the Monday, Wednesday and Thursday of the first week of the Fall term, as indicated in the calendar.

Candidates may take the uniform entrance examinations offered by the College Entrance Examination Board, which are held annually in many places. Information concerning the time and place for these examinations can be obtained by writing to *College Entrance Examination Board, Post-office Sub-Station 84, New York, N. Y.*

A college entrance diploma issued by the New York State Education Department will be accepted so far as it covers the requirements for admission, except in English and Trigonometry.

Candidates must be at least sixteen years old, and, as a preliminary to the entrance examinations, they must present to the President satisfactory testimonials of character, and register (see pages 73-74) for the necessary examinations.

Candidates from other colleges must bring letters of honorable dismissal, and must pass satisfactory examinations, or present acceptable certificates.

Candidates for a degree must enter before the close of the first Senior term.

All candidates will be examined in the English requirements, and all candidates for admission to the B, S. course or to any one of the B. E. courses will be examined in Plane Trigonometry; but in other subjects certificates from schools approved by the Faculty will be accepted, if they cover the requirements. Blank certificates, to be filled out by principals of schools, will be furnished upon application to the Dean.

Students who enter the Freshman class by certificate and fail to maintain their class standing cannot enter the next Freshman class, except by passing the entrance examinations in the departments in which they have failed.

Candidates for any other than the Freshman class are examined also in all studies previously pursued by that class.

## Requirements for Examination in 1908

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### 1. A. B. Courses

Course A.—Candidates for admission to the Freshman class in Course A. leading to the degree of A. B. will be examined in subjects Nos. 1, 2, 3, 5, 8, 9 and 10, of the list of subjects specified on pages 67-72.

Course B.—Candidates for admission to the Freshman class in Course B. leading to the degree of A. B. will be examined in subjects Nos. 1, 3, 4, 5, 8, 9 and 10, of the list of subjects specified on pages 67-72.

### 2. Ph. B. Course

Candidates for admission to the Freshman class in the course leading to the degree of Ph. B. will be examined in subjects Nos. 1, 3, 4, 5, 8, 9 and 10, of the list of subjects specified on pages 67-72.

### 3. B. S. Course

Candidates for admission to the Freshman class in the course leading to the degree of B. S. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, of the list of subjects specified on pages 67-72.

For admission to this course, Latin (No. 3) may be offered, instead of a modern language (No. 4), if desired.

### 4, 5, 6, 7. B. E. Courses

Candidates for admission to the Freshman class in any one of the four year courses leading to the degree of B. E. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, of the list of subjects specified on pages 67-72.

Candidates for admission to the Freshman class in the six year course leading to the degree of B. E. and Ph. B. will be examined in subjects Nos. 1, 4, 5, 6, 7, 8, 9 and 10, and also Latin (No. 3), of the list of subjects specified on pages 67-72.

## Lists of Subjects

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See preceding page.

### I. English

All candidates for admission to the Freshman class will be required to pass a written examination in English, and no candidate will be admitted whose work is seriously defective in spelling, punctuating, grammar, or division into paragraphs.

Questions will be set on topics and extracts drawn from the following books. The first list consists of works to be read carefully, with a view to the absorption of the subject matter, *i. e.* as books are generally read. The second list consists of books to be read with critical care, in annotated editions, and with reference to dictionary, grammar and rhetoric. The questions on this set will relate to literary form and logical structure, as well as to substance.

#### *List (1) for General Reading*

Shakespeare's "The Merchant of Venice" and "Macbeth;" Addison's "The Sir Roger de Coverley Papers" from "The Spectator;" Irving's "Life of Goldsmith;" Coleridge's "The Rime of the Ancient Mariner;" Scott's "Ivanhoe" and "The Lady of the Lake;" Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur;" Lowell's "The Vision of Sir Launfal;" George Eliot's "Silas Marner."

#### *List (2) for Minute and Critical Study*

Shakespeare's "Julius Cæsar;" Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso;" Burke's "Speech on Conciliation with America;" Macaulay's Essays on Addison and Johnson.



Attention is called to the fact that while no examination in grammar or rhetoric, as such, will occur, yet a knowledge of the essential principles of grammar and of the elementary principles of rhetoric is involved in the above requirements. An acquaintance with the general outline of the development of English literature will also be required. Newcomer's "Introduction to English Literature" and Moody and Lovett's "First View of English Literature" are recommended.

## 2. Greek

- (a) Goodwin's Greek Grammar; Pearson's "Greek Prose Composition," or an equivalent; Xenophon's "Anabasis," four books; Homer's "Iliad," three books, including Prosody.
- (b) Greek History.
- (c) The Geography of Ancient Greece.

[The attention of instructors is particularly directed to the student's need of a full and accurate knowledge of the Greek and the Latin Grammar.]

## 3. Latin

- (a) Latin Grammar and Latin Composition (e. g. Pearson's "Exercises in Latin Composition," or an equivalent); four books of Cæsar's Gallic War, or an equivalent, as Arrowsmith and Whicher's "First Latin Readings" (preferred); six books of Vergil's "Æneid;" six orations of Cicero; two thousand lines of Ovid, or Sallust's "Catiline;" the "Roman Method" of pronunciation.

The Grammars of Bennett, Harkness (Complete Edition), Allen and Greenough, West, Lane and Morgan, and Gildersleeve-Lodge are recommended.

- (b) Roman History (e. g., Botsford).
- (c) Geography of Roman Empire.

[A course of four years of preparation in Latin before the student enters college is expected.]

#### 4. Modern Languages

Either

*German*—A knowledge of grammar, comprising declension of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax and word order; a good facility in correct pronunciation and the ability to write from dictation.

Ability to translate at sight a passage of German prose or poetry of ordinary difficulty, and to convert simple English sentences into German. The candidate must have read from 300 to 400 pages of prose and poetry from various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

Or

*French*—A knowledge of grammar, comprising the forms of nouns, adjectives and pronouns; conjugation of verbs; the rules of syntax; the more common idioms; a good facility in correct pronunciation and the ability to write from dictation.

Ability to translate at sight a passage of modern French prose or poetry of ordinary difficulty, and to convert into French simple English sentences founded upon it. The candidate must have read from 300 to 400 pages of prose and poetry from various standard authors. Two years' work will ordinarily be necessary to meet this requirement.

The following outline is suggested as indicating the scope of the above requirements:

In German—

1st year	{	Joynes-Meissner German Grammar, Part I
	{	Joynes' German Reader, Pages 23-128
2d year	{	Joynes-Meissner German Grammar, Part III
	{	Three or more works of narrative prose fiction
	{	and Schiller's Wilhelm Tell

In French—

- |          |   |  |
|----------|---|--|
| 1st year | { | Whitney's French Grammar, Part I               |
|          | { | Super's French Reader                          |
| 2d year  | { | Whitney's French Grammar, Part II              |
|          | { | Three to four works of narrative prose fiction |
|          | { | Three to four modern plays                     |

### 5. Mathematics a

Arithmetic; Algebra, including Quadratic Equations, Proportions, Progressions and Logarithms; Plane Geometry.

In Arithmetic the examination will be on the following subjects: factors and multiples, common and decimal fractions, square root, the more important tables and operations of denominate numbers, percentage and simple interest, compound interest for integral periods only, bank discount, stocks and bonds, and the metric system.

In his preparation in Algebra the candidate should give special attention to factoring, fractional exponents and radicals, and the solution of quadratic equations by factoring and by the formula resulting from the solution of the equation  $ax^2+bx+c=0$ .

### 6. Mathematics b

Solid Geometry and Plane Trigonometry. No certificate covering the requirement in Plane Trigonometry will be accepted.

### 7. Physics

An elementary knowledge of Physics, such as may be gained by a year's course of study covering Mechanics, Sound, Heat, Light and Electricity, as treated in any standard High School text book. Preparation should include individual laboratory work, attested by a notebook, comprising at least thirty-five exercises, chiefly quantitative.

8. History of the United States
9. Modern Geography
10. Physiology

## Requirements for Examination in 1909

### In English in All the Courses

#### *List (1) for General Reading*

Ten books are to be selected as follows:—

#### Group I (two to be selected)

Shakespeare's "As You Like It," "Henry V," "Julius Cæsar," "The Merchant of Venice," "Twelfth Night."

#### Group II (one to be selected)

Bacon's "Essays;" Bunyan's "The Pilgrim's Progress," Part I; "The Sir Roger de Coverley Papers" in the Spectator; Franklin's "Autobiography."

#### Group III (one to be selected)

Chaucer's "Prologue;" Spencer's "Faerie Queene," (selections); Pope's "The Rape of the Lock;" Goldsmith's "The Deserted Village;" Palgrave's "Golden Treasury" (First Series) Books II. and III., with especial attention to Dryden, Collins, Gray, Cowper and Burns.

#### Group IV (two to be selected)

Goldsmith's "The Vicar of Wakefield;" Scott's "Ivanhoe;" Scott's "Quentin Durward;" Hawthorne's "The House of the Seven Gables;" Thackeray's "Henry Esmond;" Mrs. Gaskell's "Cranford;" Dickens' "A Tale of Two Cities;" George Eliot's "Silas Marner;" Blackmore's "Lorna Doone."

## Group V (two to be selected)

Irving's "Sketch Book;" Lamb's "Essays of Elia;" De Quincey's "Joan of Arc" and "The English Mail Coach;" Carlyle's "Heroes and Hero Worship;" Emerson's "Essays" (Selected); Ruskin's "Sesame and Lilies."

## Group VI (two to be selected)

Coleridge's "The Ancient Mariner;" Scott's "The Lady of the Lake;" Byron's "Mazeppa" and "The Prisoner of Chillon;" Palgrave's "Golden Treasury" (First Series) Book IV, with especial attention to Wordsworth, Keats and Shelley; Macaulay's "Lays of Ancient Rome;" Poe's "Poems;" Lowell's "The Vision of Sir Launfal;" Arnold's "Sohrab and Rustum;" Longfellow's "The Courtship of Miles Standish;" Tennyson's "Gareth and Lynette," "Lancelot and Elaine," and "The Passing of Arthur;" Browning's "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Evelyn Hope," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "The Boy and the Angel," "One Word More," "Hervé Riel," "Pheidippides."

*List (2) for Minute and Critical Study*

Shakespeare's "Macbeth;" Milton's "Lycidas," "Comus," "L'Allegro," and "Il Penseroso;" Burke's "Speech on Conciliation with America," or Washington's "Farewell Address" and Webster's "First Bunker Hill Oration;" Macaulay's "Life of Johnson," or Carlyle's "Essay on Burns."

All other requirements as 1908

Requirements for Examination in 1910 are the same as in 1909.

## Entrance Examinations

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1908

Entrance examinations will be held at the college in **June** and in **September**, in accordance with the schedule given below.

Only those who register at the appointed time will be admitted to the examinations of the following days.

### Schedule of the June Examinations

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#### Thursday, June 11

9 A. M. Candidates will present their credentials at the office of the President and register for examination.

11 A. M. Algebra ;      Physiology

2 P. M. U. S. History ; Physics

3 P. M. English

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#### Friday, June 12

9 A. M. Latin ;      Solid Geometry

11 A. M. German ;      French

2 P. M. Greek ;      Pl. Geometry ;      Pl. Trigonometry

### Schedule of the September Examinations

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#### Monday, September 14

9 A. M. and 2 P. M. Candidates will present their credentials at the office of the President and register for examination.

## Wednesday, September 16

- 9 A. M. Physics ;            Physiology  
11 A. M. Algebra ;  
2 P. M. U. S. History ;  
3 P. M. English
- 

## Thursday, September 17

- 9 A. M. Latin ;            Solid Geometry  
11 A. M. German ;        French  
2 P. M. Greek ;        Pl. Geometry ;    Pl. Trigonometry



## DEPARTMENTS OF INSTRUCTION

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The Greek Language and Literature

PROFESSOR BENNETT

In Course A, leading to the degree of Bachelor of Arts, Greek is required during the Freshman and Sophomore years, and may be elected during the Junior and Senior years; in Course B, leading to the degree of Bachelor of Arts, Greek is begun on entrance and required for four years.

**1. The New Testament**

Required of Freshmen in A. B. course A. Four hours weekly throughout the year.

**2. The Elements of Greek**

Required of Freshmen in A. B. course B. Four hours weekly throughout the year.

**3. Xenophon: The Memorabilia.—Plato: The Apology, the Crito and parts of the Phaedo.—Aristophanes: The Clouds.**

Required of Sophomores in A. B. course A. Three hours weekly throughout the year.

**4. Xenophon: The Anabasis**

Required of Sophomores in A. B. course B. Three hours weekly throughout the year.

**5. Plato: The Apology, the Crito and parts of the Phaedo.—Homer: Introductory course.**

Required of Juniors in A. B. course B. Two hours weekly throughout the year.

**6. Homer, or The Greek Drama**

Required of Seniors in A. B. course B., and elective for Juniors and Seniors in A. B. course A. Two hours weekly throughout the year.

7. **Honors:** Candidates for honors in Greek, either in A. B. Course A. or in A. B. Course B, will be required to take all the work in Greek offered in their respective courses, to maintain a general average of ninety per cent. in that work, to meet for two additional hours a week during the first two terms of the Senior year for the study of a Greek text, and to write theses on assigned subjects.

## The Latin Language and Literature

PROFESSOR ASHMORE

The studies of this department are obligatory on all students of the Freshman and Sophomore classes, who are candidates for the degree of either A. B. or Ph. B. In the Junior and Senior years Latin is elective.

1. **Livy:** Selections. Roman History (Botsford).—**Tacitus:** Minor Works.—**Cicero:** Some Minor Work. Latin Composition.

Required of Freshmen in the A. B. and Ph. B. courses.  
Four hours weekly throughout the year.

2. **Horace:** Selected Odes.—**Terence:** Phormio or Adelphoe. Lectures on Ancient Comedy.—**Plautus:** Captivi and Trinummus.

Required of Sophomores in the A. B. and Ph. B. courses.  
Three hours weekly throughout the year.

3. **Juvenal and Horace:** Satires. History of Roman Literature. Lectures on the Topography of Ancient Rome, with a study of Platner's "Ancient Rome."—**Pliny and Cicero:** Selected Letters. Private Antiquities of the Romans.

Elective for Juniors in the A. B. and Ph. B. courses.  
Two hours weekly throughout the year.

4. **Cicero:** De Officiis, or Tusculan Disputations.—**Lucretius:** Lectures on the Atomic Theory and the Philosophy of Epicurus. Early Latin: Inscriptions; or some subject especially suited to students intending to become teachers.

Elective for Seniors in the A. B. and Ph. B. Courses. Two hours weekly throughout the year.

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Parallel reading will be recommended according to the character of the authors and subjects named in the programme. Equivalents may be substituted in the programme at any time, and the order of the subjects as given above may be reversed or otherwise changed, at the discretion of the head of the department.

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**Honors.** Candidates for Special Honors in Latin are required to take all the courses of the four years, to do additional private reading, as indicated by the department, and to prepare a thesis.

## Modern Languages

PROFESSOR BARNES, ADJUNCT PROFESSOR MARCH  
AND INSTRUCTOR SMITH

### German

The courses aim to give a ready reading knowledge of German and a general acquaintance with its literature. While the literary side of the work receives chief attention after the first year, the practical is also kept in view and the study of grammatical topics and colloquial German, together with practice in writing, forms a part of every course. German is made the language of the class room whenever practicable and in some sections is used exclusively.

- 1. Elementary.** Grammar study: with exercises and supplementary composition; reading and memorizing; use of German in class. Harris's German Reader and selections on popular scientific subjects.

Required, in all courses, of Freshmen who offer French at entrance and in the B. S. course, of those who offer Latin. Three hours weekly throughout the year.

- 1a. Elementary.** Joynes-Meissner German Grammar, Parts I and III, with exercises; Brandt's German Reader. Schiller: Wilhelm Tell; Goethe: Hermann und Dorothea.

Required of Sophomores in the A. B. course of the Freshmen as in 1 who have had one year of German in school. Three hours weekly throughout the year.

- 2. Intermediate.** Thomas's Practical German Grammar for review and reference; connected composition; use of German in class. The time in class is devoted to the reading and discussion of selected works from the German classics and from recent drama and fiction; matter is also assigned for outside reading with reports and examination on the work done. The work varies somewhat from year to year, but aims to give every class an acquaintance with some of the masterpieces of German literature and some knowledge of present day German life and institutions.

Required in the Ph. B., B. S. and B. E. courses of Freshmen who offer German at entrance; in the A. B. (B.), Ph. B. and B. S. courses of Sophomores who have had German 1; and in the A. B. course of Sophomores who have had two years of German before entrance. Elective in the A. B. course of Juniors who have had 1a. Three hours weekly throughout the year in the Ph. B. and B. S. (or A. B.) courses and during terms 1 and 2 in the B. E. course.

- 2a. Intermediate.** This is a course in the reading of scientific German. A reader consisting of selections on scientific subjects forms the basis of the work and is supplemented

by one or more monographs on technical subjects within the grasp of the class at this stage of its work.

Required during the third term, of B. E. members of German 2. Three hours weekly through the term.

3. **Advanced.** Nineteenth century drama, development and leading representatives. Readings from Von Kleist and Grillparzer. *Das junge Deutschland*; assigned study. Readings from Hebbel, Ludwig and Von Wildenbruch. *Die freie Bühne*; assigned study. Nineteenth century fiction. Readings from Sudermann, Hauptmann, Meyer, Scheffel and others.

Elective for Juniors in the Ph. B. and B. S. courses who have done 2 and for Juniors in the A. B. course who have done 1a with a grade of 90. Required of Sophomores in the Ph. B. and B. S. courses who in Freshman year were admitted to both German 2 and French 2. Three hours weekly throughout the year.

- 3a. **Advanced.** Goethe and the classical period, readings and assigned studies. Lessing: *Nathan der Weise*, *Emilia Galotti*; Schiller: *Wallenstein*, *Maria Stuart*, *Jungfrau von Orleans*. Outline study of the lives of these writers. Koch: *Geschichte der deutschen Literatur* as a handbook, with references to other works.

This course alternates with course 3 and is given under the same conditions.

- 3b. **Special.** This course is given in three sections: (a) A course in composition and conversation, based on Stern's *Geschichten von deutschen Städten* or a similar work; (b) A course in commercial German, consisting of reading, correspondence and newspaper work; (c) A course in the reading of historical and political matter, with composition based on the articles read.

This course may be substituted for course 3a, and is given under the same conditions.

4. **Advanced.** Goethe: (1) A study of Goethe's life and works with readings from his autobiography (*Von Jagemann's Dichtung und Wahrheit*) and epic writings (*Bernhardt's Meisterwerke*); *Egmont*, *Iphigenie auf Tauris*, *Torquato Tasso*. (2) *Faust*: Thomas's *Faust*, Part I, reading and interpretation; the *Faust* legend in literature.

Elective for Seniors in the A. B., Ph. B. and B. S. courses who have had necessary previous training. This course will ordinarily follow course 3. Two hours weekly throughout the year.

- 4a. **Advanced.** History of German literature: *Bernhardt's Deutsche Literaturgeschichte* in class with *Vilmar's Geschichte der Deutschen Nationalliteratur* for reference, accompanied by *Musterbuch* and special readings. Two hours weekly, first half year.

A course in Middle High German: Grammar and reading, supplemented by an outline study of the history of the language. Two hours weekly, second half year.

This course alternates with course 4 and is given under the same conditions. It is expected that those electing it will have had course 3a. It is intended primarily for students who are preparing to teach German.

- 4b. **Special.** This course consists in the reading of one or more historical monographs and, when time allows, a historical novel, with parallel readings; followed by a careful study of a number of political speeches and parliamentary addresses, with discussion of the topics involved; supplemented by the reading of newspaper reports and editorial articles. The work aims to lay the foundation for future study along these lines and to give some insight into present governmental and social conditions in Germany.

This course may be substituted for course 4a, and is given under the same conditions.



- 4c. Honors** Special courses, open only to members in good standing in Senior Elective German, are offered to candidates for honors in this department.

### French

A reliable practical knowledge of French is the first result aimed at in all the classes, but as soon as possible the literary side of the language is brought to the front, and good books are read for what they contain. The more advanced courses vary somewhat from year to year, according to the judgment and preference of the instructors, and the ability and character of the students composing the classes.

- 1. Elementary.** Whitney's French Grammar; Super's French Reader; Souvestre's *L'Abbé Constantin*. Constant drill in grammatical forms, common idioms, pronunciation and writing to dictation.

Required of Freshmen in the A. B. course (A); of Freshmen in the A. B. (B), Ph. B., B. S., and B. E. courses who offer German at entrance; and in the B. S. course of those who offer Latin. Three hours weekly throughout the year.

- 1a. Elementary.** Whitney's French Grammar; review and composition; selected readings of second year or higher grade.

Required in place of French 1 of those who have had one year of French before entrance.

- 2. Intermediate.** Whitney's French Grammar: composition, writing to dictation, and memorizing. Mason's *La Lyre Française*.

In addition to daily translation in class, easy reading is assigned to be done outside and reported upon. Since this course is for most students the last required French in college, it is devoted to selected works of various



periods. The number and character of the books read may vary considerably from class to class.

Required of Freshmen in the Ph. B. and B. S. courses who offer French at entrance; in the A. B. course of those who have had two years of French before entrance. Three hours weekly throughout the year.

**2a. Intermediate.** This course is similar to course 1a.

Required of Sophomores in the A. B. (B), Ph. B. and B. S. courses who have had French 1. Three hours weekly throughout the year.

**3. Advanced.** French literature of the 19th Century. Discussion of various authors and of some phases of modern French life and character; assigned reading; careful translation in class. With suitable classes, attention is paid to French etymologies, and the laws of the evolution of the language.

Elective for Juniors of the A. B., Ph. B. and B. S. courses. Required of Sophomores in the Ph. and B. S. courses who in Freshman year were admitted to both German 2 and French 2. Three hours weekly throughout the year.

**4. Advanced.** French literature of the 17th Century.

Selected works of Corneille, Racine, Molière, and La Fontaine, are read carefully in class. Assigned readings, discussions of men, of their work and of the period.

This course may in any year be a continuation of course 3.

Elective for Seniors of the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

**4a. Honors.** Advanced courses, leading to special honors in French, are offered to those students who are qualified to pursue them.

### Spanish

This course aims to ground the student in the grammar of modern Spanish and to give a good reading knowledge of the language. Practice in writing is continued throughout the course.

1. **Junior Elective.** Hills and Ford's Spanish Grammar, with exercises. Ramsey's Reader, practice and sight translation. Selections from Gil Blas, a recent novel and a modern play are read.

Open to Juniors in the A. B., Ph. B. and B. S. courses and to Seniors who have not had Spanish in Junior year. Three hours weekly throughout the year.

2. **Senior Elective.** Grammar and composition, commercial correspondence and newspaper reading. In connection with a brief survey of the development of Spanish literature, one or two dramas of the classical period and one or two modern plays are read, together with some works of recent fiction. The amount read depends upon the nature of the works selected and the ability of the students composing the class.

Open to Seniors who have had Spanish 1. Two hours weekly throughout the year.

### English Language and Literature

PROFESSOR HALE

1. **Old English.** This course gives an introduction to the language in Cook's First Book in Old English, with especial attention to the phonology and the relations of Old and Modern English with the other Teutonic languages. In the third term the work is carried on either by a study of Old English poetry in "Beowulf" or by further reading in West Saxon prose, especially the Chronicle.

Elective for Juniors in all courses. Two hours weekly throughout the year.

2. **History of English Literature.** This study is pursued with a text-book for the purpose of giving a foundation knowledge of the facts of English Literature.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Two hours weekly during the fall and winter terms.

3. **Shakespeare.** A careful reading of "Hamlet," with particular attention to the language, action and characters, and a summary of questions of text, date, and sources. A view is also given of the conditions of the Elizabethan theatre, and the general standpoint taken is that of the acted drama.

Required of Sophomores in the B. E. course during the fall term, and of Sophomores in the A. B., Ph. B. and B. S. courses during the spring term. Three and two hours respectively.

4. **Shakespeare.** A study of plays chosen to represent the different periods of Shakespeare's life and the different forms of the Shakespearean drama. Six plays will be read each year, different plays being chosen each year from those of the year before.

Elective for Seniors and Juniors in all courses. One hour weekly throughout the year.

5. **Modern Poetry.** The study of some great poem of the nineteenth century: in 1906-7 Tennyson's "Idylls of the King" was the subject.

Required of Sophomores in the B. E. course. Two hours weekly during the winter term.

6. **English Prose.** The course considers especially the novel, the essay, and the oration. In each case especial attention is given to the general character of the literary form in question and the specific character of the differ-

ent authors that can be treated. In the first term Perry's "Study of Prose Fiction" is used: in the other terms the work is carried on without a text-book.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

7. **English Poetry of the Nineteenth Century.** An introduction to the critical study of poetry. Page's "British Poets of the Nineteenth Century" furnishes a collection of texts in which the work may readily be followed. The main plan is to form habits of discrimination, and a poetic taste by distinguishing between the characteristics of the different poets read.

Elective for Seniors in all courses. Two hours weekly throughout the year.

8. **Honors.** Advanced courses leading to special honors are offered to those students who are qualified to pursue them.

## Rhetoric and Public Speaking

PROFESSOR MCKEAN

1. **Freshman Rhetoric.** The work is pursued with study of a text-book, Adams Sherman Hill's "Principles of Rhetoric" being now used.

Required of Freshmen in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

- 1a. **Freshman Rhetoric.** The work is pursued by text-book, as in course 1. The instruction, however, is somewhat more technical and scientific in general character than that of course 1.

Required of Freshmen in the B. E. course. Two hours weekly throughout the year.

2. **Sophomore Rhetoric.** The work consists in the writing of orations with criticism and a delivery of them, either in special appointments or before the class, and the writing and criticism of essays.

Required of Sophomores in the A. B., Ph. B., B. S. and B. E. courses. One hour weekly throughout the year.

3. **Junior Rhetoric.** The work is like that of course 2, but of a more advanced character.

Required of all Juniors. One hour weekly throughout the year.

4. **Argumentation and Debate.** The work follows Alden's "Art of Debate," but gives a good deal of practice in preparation of briefs and arguments and in oral debates.

Elective for Juniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

5. **Advanced Argumentation and Debate.** The work is like that of course 4, but of a more advanced character.

Elective for Seniors in the A. B., Ph. B. and B. S. courses who have completed course 4.

6. **Senior Rhetoric.** The work is like that of course 2, but of a more advanced character.

Required of all Seniors in the A. B., Ph. B. and B. S. courses. One hour weekly throughout the year.

- 6a **Senior Rhetoric.** One literary essay each term.

Required of Seniors in the B. E. course during the fall and winter terms.

## History and Sociology

PROFESSOR RIPTON AND INSTRUCTOR HUTCHISON

The work of the department covers three years, beginning with the first term of the Sophomore year. The instruction is given by text-book, by lectures, and by library references.

1. **English History.** The narrative history of England is made the basis of study, but especial attention is given to the industrial, commercial and social history of the country, and to the development of the English Constitution. The importance of collateral readings from the English authorities is emphasized.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, first and second terms.

2. **French History.** Beginning with a brief study of Roman Gaul, the main purpose is to show the growth of the French nation and the working of the different forces which promoted or retarded the unity of the state. The period studied concludes with the year 1789. The history of France from that date to the present is taken up in greater detail in Course 4.

Required of Sophomores in A. B., Ph. B. and B. S. courses. Two hours weekly, third term.

3. **American History.** A study is made of the period of American discovery and exploration and of the colonial period. The main part of the work, however, begins with an examination of the causes of the American Revolution. The course is guided by text-books and lectures, and much work is done in the library among the sources and authorities.

Elective for Juniors in A. B., Ph. B. and S. courses. Three hours weekly throughout the year.

4. **French Revolution and Nineteenth Century.** This course considers the causes, ideas and progress of the French Revolution and the reconstruction of European politics and society produced by the revolutionary and Napoleonic wars. It then takes up an examination of the events and forces which contributed to the unification of Italy and of Germany, and concludes with a brief study of the Eastern Question. The course is designed to give a clear



understanding of political affairs as they exist in Europe to-day and the historical process by which they were brought about.

Elective for Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

5. **Comparative Politics.** A comparative study is made of the constitutions and governments of England, the United States, and the principal nations of Continental Europe. Sufficient attention is given to historical origins to account for characteristic differences, but the work consists mainly of a systematic study of the constitutions, their adoption and methods of amendment, the distribution of governmental powers, and their practical operation, including some account of political parties.

Elective for Seniors. Two hours weekly throughout the year.

6. **Economics.** It is the design of this course to give instruction in the leading principles of Economics. While a text-book is used in order to secure more rapid progress, still the views of no school are taught exclusively. By lectures and required collateral reading an attempt is made to present the results of the latest and most approved investigations in the science. The course closes with a series of lectures upon the history of Political Economy.

Required of Seniors in all courses. Three hours weekly, first term.

7. **Sociology.** In this course the mutual relations of men in society are examined historically, that the student may learn how present conditions have resulted from past experience. Present social forces and needs are considered, with the purpose of training the students to fulfil the demands of good citizenship. The collateral reading and prac-



tical sociological investigation is guided throughout the course by lectures.

Required of Seniors in A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

8. **Honors.** Candidates for Special Honors in History are assigned subjects for study which are designed to give training in historical method and the use of sources.

## Mental and Moral Philosophy

PROFESSOR HOFFMAN

The courses in this department begin with the first term of the Junior year and extend through the entire Senior year. Logic, Elementary Psychology and Elementary Ethics come in the Junior year and are required. All the other courses are taken up in the Senior year and are elective. Instruction in the various studies of the department is usually given by means of lectures, discussions, and the use of a text-book.

1. **Logic.** This study, inasmuch as it is required, is confined to the simple elements of the science. As soon as the rules of correct thinking are mastered, the student is put at once to the analysis of arguments, the chief purpose of the study being to develop skill in detecting fallacies. Extracts from many authors are brought before the class for criticism, and so far as possible they are taken from every field of thought.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during the first term.

2. **Elementary Psychology.** This course is designed to acquaint the student with the most obvious facts of his mental experience; and the attempt is made to classify these facts into a system. The relation of Psychology to the other sciences is set forth, and the importance of the

study is emphasized in that it lays the foundation for all the sciences of man as a political, moral and religious being.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during the second term.

3. **Elementary Ethics.** Only the outlines of the subject are presented in this course. The ordinary duties of man are pointed out by first describing those concerning himself and those that arise from his relation to others, to nature, and to God.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

4. **Advanced Psychology.** The chief problems discussed in this course are the recent views concerning the nature of perception, the localization of functions and the theories concerning memory, conception, the emotions and the will. The facts of abnormal Psychology are also here considered, especially insanity, dreams, hypnotism, telepathy, and the hypothesis of a secondary self.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during first term.

5. **Advanced Ethics.** Some account of the history of Ethics is given in this course, and present ethical theories are stated and discussed. The relation of Ethics to other sciences is emphasized and much attention is given to the ethical problems involved in such questions as education, taxation, transportation, corporations, the treatment of criminals, the care of the poor, and the formation and dissolution of the family.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during second term.

6. **Evolution of Religion.** The object of this course is to show how religion originates and to trace out the steps

taken in its development. The chief ideas of the leading religions of the heathen world are critically examined, their excellencies and defects are pointed out, and a comparison of them is made with the special doctrines of the Christian system.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

7. **History of Philosophy.** The attempt is made in this course to go over with considerable detail the general field of Philosophy from the earliest times down to the present day. In this way the views of the principal thinkers of the world are presented and discussed upon a great variety of problems, such as the validity of knowledge, the nature of virtue, the foundations of the State and the existence of God. Much is made in this course of the historical connection of the different systems for the purpose of impressing upon the mind of the student the successive steps that have been taken in the actual development of thought.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

8. **Honors.** Advanced courses leading to special honors in this department are offered to those students who are qualified to pursue them.

## Mathematics

ASSISTANT PROFESSOR GARIS

Mathematics is required in the A. B., Ph. B. and B. S. courses during the Freshman year and is elective during the Sophomore, Junior and Senior years. The object of the instruction in these courses is to train the student to clear and exact thinking and to provide him with a knowledge of

mathematics broad enough to enable him to give instruction in preparatory schools or to pursue his studies further to good advantage.

The following courses are given:

**1. Solid Geometry.** Wentworth's Geometry.

Required of Freshmen in the A. B. and Ph. B. courses.  
Four hours weekly during the first term.

**2. Higher Algebra.** Downey's Algebra.

Required of Freshmen in the B. S. course during the first term, and of Freshmen in the A. B. and Ph. B. courses during the second term. Four hours weekly.

**2a. Algebraic Analysis**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses. Two hours weekly during the third term.

**3. Trigonometry.** Murray's Plane Trigonometry.

Required of Freshmen in the A. B. and Ph. B. courses.  
Three hours weekly during the third term.

**4. Plane Analytic Geometry.** Tanner and Allen's Analytic Geometry.

Required of Freshmen in the B. S. course. Three hours weekly during the second and third terms.

**4a. Plane Analytic Geometry.** Tanner and Allen's Analytic Geometry.

Elective for Sophomores in the A. B. and Ph. B. courses. Two hours weekly throughout the year.

**4b. Solid Analytic Geometry and Determinants**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 4 or 4a. Two hours weekly during the first term.

**4c. Higher Plane Curves**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 4b. Two hours weekly during the second term.

**5. Calculus. Murray's Infinitesimal Calculus.**

Elective for Sophomores in the B. S. course and for Juniors in the A. B. and Ph. B. courses who have had 4a. Two hours weekly throughout the year.

**5a. Advanced Calculus**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5. Two hours weekly during the first term.

**6. Differential Equations. Murray's Differential Equations**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5a. Two hours weekly during the second term.

**7. Theory of Function of Real Variables**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 5a. Two hours weekly during the second term.

**7a. Theory of Functions of a Complex Variable**

Elective for Juniors and Seniors in the B. S. course and for Seniors in the A. B. and Ph. B. courses who have had 7. Two hours weekly during third term.

**8. Honors. Candidates will be given advanced work in various subjects suited to their special ability.**

Open to Seniors in the A. B., Ph. B. and B. S. courses. Two hours weekly throughout the year.

Students in Engineering are given instruction in mathematics in the Department of General Engineering; the work is described on pages 146-147.

## Mechanics and Physics

PROFESSOR OPDYKE

The required work in Physics extends through the three terms of the Sophomore year. This is followed by electives in laboratory work and in Mathematical Physics. The collection of apparatus for the illustration of lectures is extensive, and has been secured largely from foreign makers, including sets of standard pattern by Koenig, Duboscq, Ruhmkorff and others.

The courses in more detail are these:

- i. **General Physics.** This course is intended to give a general presentation of the facts and laws of Physics. No knowledge of mathematics is assumed beyond an acquaintance with Algebra and Plane Trigonometry. Experimental lectures, recitations and discussions aim to make the student familiar with the chief phenomena of Physics and their explanation.

Required of Sophomores in the A. B., Ph. B. and B. S. courses. Three hours weekly throughout the year.

- ia. **Elective in Laboratory Work.** This course is open to those who have taken i, and consists of individual work by the students themselves in the laboratory. The experiments performed are such as allow accurate measurement of the quantities involved; and the results obtained are used to verify some general law, or to obtain some physical constant of nature.

Elective for Juniors and Seniors in the A. B., Ph. B. and B. S. courses. Two periods of two hours each weekly throughout the year.



2. **General Physics for Engineers.** This course treats the subject more mathematically than 1, and is given to students in the Engineering course. The Calculus is used, more especially during the second and third terms. Assuming some knowledge of the fundamental facts of Physics, attention is paid to the discussion of the phenomena and their mathematical analysis, in so far as this is possible with the use of the more elementary analytical methods. The work consists of lectures, recitations and laboratory practice.

Required of Sophomores in the B. E. course. Two, three and three classroom hours a week throughout the first, second and third terms, respectively; and one laboratory period a week throughout the year.

- 2a. **Elective in Mathematical Physics.** This course is open to those who have taken 2, and aims to carry out and complete the mathematical discussion of some parts of the subject. A good knowledge of Calculus is required, and an elementary knowledge of Differential Equations. Some time is devoted to a further study of Differential Equations as applied to physical problems, and through lectures and assignments of reading the student is introduced to more advanced work.

Elective for Juniors and Seniors who have taken 2. Two hours a week throughout the year.

3. **Astronomy.** A short course in Astronomy is also given. This course is general and descriptive in character, including some reference to the more elementary mechanical aspects of the subject.

Required of Juniors in the A. B. and B. S. courses, and open as an elective to the Juniors in the Ph. B. course. Three hours a week throughout the second term.

4. **Spherical Trigonometry and Astronomy.** This course differs from the preceding in that it begins with the study



of Spherical Trigonometry as applied to some of the problems of practical Astronomy. The course is less descriptive and more mathematical than 3.

Required of Juniors in the General Engineering course, Option A, and in the Sanitary Engineering course. Three hours a week throughout the third term.

5. **Honors.** Candidates for Special Honors must have taken the elective in Mathematical Physics (2a) and are required to complete a special course of assigned work and reading, extending throughout the Senior year, and to submit theses.

## Chemistry

PROFESSOR ELLERY AND MR. EASTMAN

The object of the instruction in this department is to develop power of accurate observation, of logical reasoning, and of forming correct judgments on observed facts. Students who are planning special courses in Chemistry, Medicine, Biology, Geology, or other branches of natural science, will find the courses of great value.

1. **General Chemistry.** The course includes an exhaustive study of the non-metals and their compounds, together with the fundamental laws and theories of Chemistry, a special study of the common metals, and an introduction to Organic Chemistry. The work is distributed through the year as follows:

Fall term: Theories and general principles; study of the occurrence, preparation and properties of the non-metals.

Two lectures and one laboratory period each week.

Winter term: Study of the occurrence, metallurgy and properties of the common metals, and reactions for the metals in solution.

Two lectures and one laboratory period each week.

Spring term: Study of reactions of acid radicals in solution. Elementary blowpipe analysis.

One lecture and four laboratory periods each week.

Required of Sophomores in the B. E. course.

- 1a. General Chemistry.** This course is similar to course 1, in that it includes the study of metals and non-metals, theories and principles, but no analytical work is done.

Required of Freshmen in the B. S. course, and of Sophomores in the Ph. B. course. Elective for Juniors and Seniors in the A. B. course. Two lectures and one laboratory period a week throughout the year.

- 2. Qualitative Analysis.** This course comprises a systematic examination of metals and acid radicals in solution, and a systematic examination of complex solids.

Required of Juniors in the B. E. course. Three laboratory periods a week during the fall term.

- 2a. Qualitative Analysis.** A study of the reactions of bases and acids in solution, a complete course in blowpipe analysis, a systematic examination of solutions of metals and acids, and of complex solids. The aim of the year's work is to enable the student to make a complete qualitative analysis of complex inorganic substances.

Required of Sophomores in the B. S. course, elective for Juniors and Seniors in the Ph. B. course, and for Seniors in the A. B. course who have had course 1a. Three laboratory periods a week throughout the year.

- 3. Quantitative Analysis.** This is a course in which the student becomes familiar with the various gravimetric and volumetric methods of analysis.

Elective for Juniors in the B. S. course, and for Seniors in the Ph. B. course, who have had course 2a. Three hours a week throughout the year.

4. **Organic Chemistry.** This course comprises analysis of organic compounds, the preparation of typical organic substances, and a thorough study of the principles and theories of organic chemistry.

Elective for Seniors in the B. S. course, who have had course 3. Three hours a week throughout the year.

5. **Special Analyses.** This course includes Quantitative Analysis, both gravimetric and volumetric determinations of common elements, a thorough course in Water Analysis, comprising a study of proper sanitary conditions, as well as complete chemical analysis of various samples of water, collected by the student, and a short course in milk analysis.

Required of Seniors in the Sanitary Engineering course. Two hours a week during the fall and winter terms.

6. **Honors.** Students who have completed course 3 and whose grades in all the work of the department meet the requirements, are eligible to honors in the subject of Chemistry. Such students are required to do some special analytical work and to submit a thesis on the results of their investigations.

## Biology and Geology

PROFESSOR STOLLER

1. **General Biology.** This course is intended to give the student a knowledge of living plants and animals, to afford mental training in the study of nature, and to give the student a grasp of the broader facts and principles of biological science in their general philosophical values. Recitations and laboratory work.

Required of Sophomores in the B. S. course, three hours weekly throughout the year, and of Juniors in the Ph. B. course during the first two terms.

2. **Animal Morphology.** This course is adapted for students who wish a somewhat advanced knowledge and training in biology, especially as a preparation for teaching or for the medical profession. The work is mainly in the line of comparative anatomy, and includes the dissection of several vertebrate types in detail. Some time is given to elementary histology and embryology, involving the technique of section-cutting, etc. The course includes the reading of texts in general zoology and embryology.

Elective for Seniors in the A. B., Ph. B. and B. S. courses. Three hours (six hours of laboratory work) weekly throughout the year.

3. **Bacteriology.** Students who have elected course 2 may be permitted to take, in the third term, elementary practical bacteriology as an extra or in place of a part of the anatomical work.
4. **General Principles of Zoology.** The aim of this course is to use the data of zoology for their worth as contributing to liberal culture. The more general facts and principles of animal structure, function and development are reviewed and considered in their relation to the study of man. The scientific evidences of organic evolution and the theories of evolution of various authors are considered. Lectures.

Required of Juniors in the A. B., Ph. B. and B. S. courses. Three hours weekly during third term.

5. **Sanitary Biology.** In this course those organisms especially bacteria, which bear a causal relation to disease and the recent applications in sanitary science of our knowledge of the nature of these organisms, are considered. Some laboratory work in bacteriology is done.

Required of general and sanitary engineers in the Senior Class. Three hours weekly during the second term.

6. **General Geology.** The instruction in this course is adapted primarily to the study of the science as a branch of liberal culture, but enough practical work is included to afford a foundation for special study or for teaching. The work includes laboratory study in determining the common minerals and rocks, and some field work in structural and historical geology.

Required of Juniors in the A. B. and B. S. courses; elective in the Ph. B. course. Three hours weekly in the first term.

7. **Field Geology.** This course is supplementary to the preceding. The geological formations readily accessible from Schenectady are inspected, fossils are collected and readings from the State geological reports and other literature of the science are made.

Required of Ph. B. students who elect the preceding course. It may be taken as an extra, by permission of the faculty, by A. B. and B. S. students who have taken the preceding course. Three hours weekly during third term.

8. **Economic Geology.** In this course, after a brief study of the principles of dynamic and structural geology, the work is related to the occurrence and distribution in the United States of building stones, mineral ores, coal and other economic products. Recitations, lectures and some laboratory work. Required of Seniors in the B. E. courses. Two hours weekly during the first term.
9. **Honors.** Advanced courses leading to special honors in this department are offered to those students who are qualified to pursue them.

## Physiology and Physical Training

DR. MCCOMBER

Human Anatomy, Physiology, Hygiene and Physical Training are required in all courses. In the Freshman year

the work consists of recitations and lectures, demonstrated by means of the microscope, the manikin and the human skeleton. An attempt is made to give a practical course covering the essential facts of the subject with the idea of arousing in every student a genuine self interest, of developing a wholesome self respect without overwhelming him with the mass of details that must be considered in a close study of anatomy.

During the fall term of the Sophomore year a course in Hygiene is given designed to acquaint the student with practical laws concerning the preservation of health and to impress upon his mind the dependence of health upon the consistent observance of such laws. Knowledge is of little value unless it find some application. Lectures on "First Aid to the Injured," "Bacteriology," "Contagious and Infectious Diseases" and "Social Purity" form a part of the course.

It is the aim of the department to give the student such a training in the methods of Physical Education that he may have a comprehensive knowledge of the subject, and to secure health, vigor and such harmonious development of the body as will fit it to resist disease, and prepare it for efficient service, both now and later in life.

Work in the gymnasium is required of Freshmen only, but the organization of voluntary classes makes it possible for all to secure the advantages of systematic exercise. The course in the gymnasium is so arranged as to give a knowledge of the different kinds of apparatus pertaining to physical training. Commencing with light work, consisting of free gymnastics, club, dumb-bell and wand exercises, the course leads through a graded series, involving heavier work as the student becomes fitted for it.

A physical examination of new students is made at the beginning of the year and corrective exercises are prescribed for the remedy of physical defects. Charts of the physical measurements showing the comparison of the individual with the normal development and hand books containing much valuable hygienic data are furnished upon payment of a small fee. All candidates for college terms are required to pass a



satisfactory physical examination before they are allowed to compete in athletic contests.

It is the policy of the department, so far as the equipment will permit, to influence the entire student body to take an active part in athletic sports and gymnastics and not to cater to the exceptional athlete to the exclusion of those who are physically less perfectly equipped.

### Lectures

It is the policy of the college to provide its students with the advantages of frequent lectures by specialists in the various departments of knowledge.

### Library

The library occupies Nott Memorial Hall. It contains forty thousand volumes and includes the engineering and scientific library of the late Professor Gillespie, the collection of mathematical works made by the late John Patterson, of Albany; the library of the late Hon. Henry J. Cullen, of the class of 1860, and the library of ancient and classical language and literature of the late Professor Tayler Lewis. The income from a bequest of five thousand dollars left by the late Lemon Thomson, Esq., of Albany, of the class of 1850, is devoted to the purchase of books on American subjects, especially history and political science. An alcove, known as the "Thomson Alcove," is reserved for these books. By the will of the late Rev. Oscar Blakeslee Hitchcock, of the class of 1852, a bequest of upwards of thirty thousand dollars was left to the College for the purchase of books, manuscripts, etc. The most important accession of the past year is the "Croes Engineering Library," the gift of Mr. Edgar Beach Van Winkle of the class of 1860. The library is classified according to the Dewey decimal system.

One hundred and fifteen periodicals and the transactions of many learned societies are received.



### Library Rules

Hours 8-1; 2-6; 7-9 from Monday to Friday. 8-1; 7-9 on Saturday.

The library will be closed on Sundays and legal holidays.

The library will be open during vacation at hours to be announced.

Loan of books: Reference, Cullen and valuable books are not to be loaned.

Reserved books may be loaned over night, i. e., from 9 p. m. to 8 a. m. There will be a fine of \$1.00 per day or part of a day for each reserved book overdue.

Periodicals are regarded as reference books.

All other books may be loaned, not more than two at a time, for a period of two weeks, and may be once renewed, unless called for. A fine of ten cents per day will be charged for all books overdue and all library privileges will be withdrawn until the book is returned and the fine paid.

### The Natural History Museum

PROFESSOR STOLLER, CURATOR

In Zoology, the collection of mounted birds numbers 311 specimens, representing 161 species of the bird fauna of the Eastern United States. Plans are now being made whereby these specimens will be reclassified and labelled. Of mammals there is a collection of 57 skins, the gift of the U. S. National Museum, and a number of skulls, skeletons and mounted specimens. Fishes, amphibia and reptiles, especially of the local fauna, are represented by specimens in alcohol. In the department of invertebrates the collections of marine animals made by Dr. Harrison E. Webster are extensive, including sponges, corals, worms, crustacea and mollusks, the total number of species represented being over 5,000. The Wheatley collection of shells, presented by E. C. Delavan, Esq., consists of 8,000 specimens. The botanical collections include a nearly complete set of local flowering plants, the work of Professor Jonathan Pearson. To this there has

since been added a complete set of the ferns and fern allies of Schenectady County. The flora of the United States is further represented by collections from Virginia, the Red River region of the Southwest, and those made by Dr. Nevius in Alabama. The lower cryptogams are represented by a valuable collection of 2,300 specimens of fungi, the gift of Mr. J. B. Ellis, of the class of 1851. The Herbarium also includes a considerable number of foreign plants, including representative collections from Germany, Spain, Asia Minor and England, as well as some specimens from Iceland, Norway, France and Switzerland. They have been sorted and distributed in a single series following the latest accepted sequence, that of Engler and Prantl's *Natürliche Pflanzenfamilien*, making the entire collection of some 8,000 or 10,000 specimens readily accessible for reference and study.

In Mineralogy, the Wheatley collection of minerals given by E. C. Delavan, Esq., which is labelled according to the system of Dana, contains 4,000 specimens, many of which represent the more valuable forms.

In Geology there is a general collection of rocks and minerals, comprising some 3,000 specimens; and a considerable collection of Paleozoic and Mesozoic fossils. The collections made by the geological department under the direction of Professor C. S. Prosser so increased the museum that there is plenty of material now available, especially for the careful study of the Paleozoic rocks and fossils of the New York formations.

Recently there has been added the educational series of rock specimens, the gift of the United States Geological Survey.

CURRICULUM OF THE A. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 4 Solid Geom- etry 1 Physiology Greek Prose Composition Latin Prose Composition	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 4 Algebra 1 Physiology Greek Prose Composition Latin Prose Composition 1 Gymnastics	4 Greek 4 Latin 3 French, or <sup>2</sup> German 2 Rhetoric 3 Trigonometry 1 Physiology Greek Prose Composition Latin Prose Composition 1 Gymnastics
Sophomore Year	3 Greek 3 Latin 3 German, or <sup>2</sup> French 2 English and Rhetoric 2 History or Mathematics 3 Physics 1 Hygiene	3 Greek 3 Latin 3 German, or <sup>2</sup> French 3 English and Rhetoric 2 History or Mathematics 3 Physics	3 Greek 3 Latin 3 German, or <sup>2</sup> French 3 English and Rhetoric 2 History or Mathematics 3 Physics
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>3</sup>	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>3</sup>	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>3</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>3</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Those entering Course A—see page 62, take French during Freshmen Year and German during Sophomore Year. Those entering Course B—see page 62, take two years of that modern language not offered for admission.

<sup>3</sup>For list of electives, see pages 108, 109.

CURRICULUM OF THE PH. B. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	4 Latin 3 German 3 French 2 Rhetoric 4 Solid Geometry 1 Physiology Latin Prose Composition	4 Latin 3 German 3 French 2 Rhetoric 4 Algebra 1 Physiology Latin Prose Composition 1 Gymnastics	4 Latin 3 German 3 French 2 Rhetoric 3 Trigonometry 1 Physiology 1 Gymnastics
Sophomore Year	3 Latin 3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 1 Hygiene	3 Latin 3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry	3 Latin 3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry
Junior Year	3 English and Rhetoric 3 Logic 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Psychology 3 Biology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Ethics 3 Biology 7 Elective <sup>2</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see pages 108, 109.

CURRICULUM OF THE B. S. COURSE<sup>1</sup>

	First Term	Second Term	Third Term
Freshman Year	3 French 3 German 2 Rhetoric 4 Algebra 3 Chemistry 1 Physiology	3 French 3 German 2 Rhetoric 3 Analytic Ge- ometry 3 Chemistry 1 Physiology 1 Gymnastics	3 French 3 German 2 Rhetoric 3 Analytic Ge - ometry 3 Chemistry 1 Physiology 1 Gymnastics
Sophomore Year	3 German or French 2 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology 1 Hygiene	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology	3 German or French 3 English and Rhetoric 2 History or Mathematics 3 Physics 3 Chemistry 3 Biology
Junior Year	3 English and Rhetoric 3 Logic 3 Geology 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Psychology 3 Astronomy 7 Elective <sup>2</sup>	3 English and Rhetoric 3 Ethics 3 Evolution 7 Elective <sup>2</sup>
Senior Year	1 Rhetoric 3 Economics 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>	1 Rhetoric 3 Sociology 13 Elective <sup>2</sup>

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see pages 108, 109.

## LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments]

Junior Year<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
3 German	3 German	3 German
3 French	3 French	3 French
3 Spanish	3 Spanish	3 Spanish
2 Anglo-Saxon	2 Anglo-Saxon	2 Anglo-Saxon
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Advanced Rhetoric— Argumentation	2 Advanced Rhetoric— Argumentation	2 Advanced Rhetoric— Argumentation
3 American His- tory	3 American His- tory	3 American His- tory
2 Modern Analytical Geometry	2 Advanced Calculus <sup>3</sup>	2 Differential Equations
2 Calculus <sup>2 3</sup>	2 Calculus <sup>2 3</sup>	2 Calculus <sup>2 3</sup>
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 Geology	3 Astronomy	3 Field Geology

<sup>1</sup>The figure at the left indicates the number of hours per week devoted for class work.

<sup>2</sup>For the A. B. course.

<sup>3</sup>For the Ph. B. course.



## LIST OF ELECTIVES FOR ALL COURSES

[For limiting conditions, see statements of respective departments]

Senior Year<sup>1</sup>

First Term	Second Term	Third Term
2 Greek	2 Greek	2 Greek
2 Latin	2 Latin	2 Latin
2 Spanish	2 Spanish	2 Spanish
3 Spanish <sup>3</sup>	3 Spanish <sup>3</sup>	3 Spanish <sup>3</sup>
2 German or French	2 German or French	2 German or French
2 English Poetry	2 English Poetry	2 English Poetry
1 Reading of Shakespeare	1 Reading of Shakespeare	1 Reading of Shakespeare
2 Comparative Politics	2 Comparative Politics	2 International Law
3 European History	3 European History	3 European History
3 History of Philosophy	3 History of Philosophy	3 History of Philosophy
3 Advanced Psychology	3 Advanced Ethics	3 Evolution of Religion
2 Modern Analytical Geometry	2 Advanced Calculus	2 Differential Equations
2 Higher Plane Curves	2 Geometry of Three Di- mensions	2 Theory of Functions
2 Mathematical Physics	2 Mathematical Physics	2 Mathematical Physics
2 Physical Laboratory	2 Physical Laboratory	2 Physical Laboratory
3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>	3 General Chemistry <sup>2</sup>
3 Qualitative Analysis	3 Qualitative Analysis	3 Qualitative Analysis
3 Quantitative Analysis	3 Quantitative Analysis	3 Quantitative Analysis
3 Organic Chemistry	3 Organic Chemistry	3 Organic Chemistry
3 General Geology	3 General Geology	3 General Geology
3 Morphology	3 Morphology	3 Morphology

<sup>1</sup>The figure at the left indicates the number of hours per week required for class work.<sup>2</sup>For the A. B. course.<sup>3</sup>For those who have not had Spanish in Junior Year.



## GENERAL REGULATIONS

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**Registration.** Every student must report at the Registrar's office at the beginning of each term and register college or local residence. Any change of residence during the term must be reported at once, in conformity with the regulation made by the Treasurer's office.

**Reports.** A daily record of scholarship and of attendance at class and chapel is kept, and is transmitted at the close of each term, or more frequently, to the student's parent or guardian.

**Standing.** There are four grades of scholarship:—from 9 to 10 inclusive, first grade; from 8 to 8.9, second grade; from 7 to 7.9, third grade; from 6 to 6.9, fourth grade. A student who receives a mark of 4 to 5.9 is reported as conditioned; below 4, as failed. In the mathematical studies of the engineering course the sustaining mark is 7, and any mark below 5 indicates failure.

A student who is reported as having failed in any subject must take that subject again in class; or he may be required, at the option of the department concerned, to make up the subject under an approved tutor, in such manner as the department may designate, and to pass an examination in it at the second conditions examination after the imposition of the mark of failure.

Those receiving the three highest marks for the whole course in the Engineering Department and the seven highest marks in the other departments are entitled to appointment as Commencement Orators.

**Absences in General.** Absences are entered (in every course) against a student from the beginning of a term until he reports his return to the Registrar.

Absences are recorded as of three kinds:—allowed, excused and unexcused. Excuses must be obtained from the Dean in writing.

**Class-room Absences.** Students will be allowed, each term, as many absences without excuse, in any subject, as there are recitations per week in that subject. But this rule does not apply to examinations, or to recitations just before or after any vacation or recess, or to any class as a whole at any time, and is not to be interpreted as remitting any part of the total work of the term.

Any absence not an allowed absence will be reckoned as a failure in recitation or in examination, as the case may be, unless excused by the Dean.

No excuse will be granted except for protracted illness, or for reasons in every way exceptional. The allowed absences are intended for cases of necessity only, and should not be used for other purposes in the expectation of receiving an excuse for a subsequent necessary absence.

When the total number of allowed and excused absences exceeds the number of recitations per week in that subject, the student will be required to take a special preliminary examination before he can proceed to his regular term examination.

After a number of unexcused absences equal to three weeks of recitations in any subject, the student will not be allowed to continue his work in that subject, but must take it with the succeeding class.

**Chapel Absences.** Twelve absences without excuse will be allowed each term. All absences after the first twelve lower the standing at the rate of one unit for every two absences.

No absences will be excused except for protracted illness or for reasons in every way exceptional.

In the determination of a student's general standing marks for chapel attendance are counted as the equivalent of a one hour per week recitation. They affect the granting of scholarships and the selection of honor men.

**Conditions.** Students admitted with entrance conditions are required to remove them not later than the examination for the removal of conditions in the following March. Students who fail to meet this requirement are classed as irregular students. No student who has any conditions unsatisfied at the close of the conditions examination in September at the opening of the college year, will be permitted to continue with his class without the express authorization of the Faculty.

Conditions not removed at the next conditions examination held after their imposition must be made up in class at the first opportunity, and this work shall take precedence of the regular work in case of conflict in the schedule. No Senior who has failed to make up all his back work by the end of the second term of Senior year can be recommended for a degree, except by special vote of the Faculty.

Examinations for the removal of conditions occur on the Saturday next preceding the opening of the fall term, and on the first Saturday in December, March and May, as indicated in the College calendar. Registration for these examinations closes at 2:30 p. m. on the Wednesday next preceding the date set for each. A fee for each examination to be taken must be paid at the time of registration, at the College Office.

Students who have been excused by the Dean, in writing, from any term examination will be reported "not examined" and may be examined later, at the option of the instructor, but such examination cannot be postponed beyond the first conditions examination. A failure to pass will be regarded as a condition which must be made up at the next following conditions examination.

Unless excused in writing by the Dean, students absent from term examinations will be reported as "Not sustained," or "Failed."

Any student permitted by the Faculty to anticipate or defer a term examination will be required to pay a fee for each special examination made necessary.

A failure to report at any appointed examination will be regarded as a trial, unless previously excused.

**Irregular Students.** Students who are seriously deficient in standing may be dropped to a lower class, or if the deficiency is such as to leave a prospect of regaining class standing, may be rated as irregular students. Irregular students have no class relation or class privilege; they are debarred from competition for prizes and from the attainment of special honors.

**Changes of Course.** Students are not permitted to pass from one course to another, or to take any studies out of their regular order, without the specific authorization of the Faculty.

The evidence that a student's continuance in college is resulting in no advantage to himself, or in harm to others, will occasion his separation from the institution.

## EXPENSES

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Matriculation fee.....	\$5.00
Tuition, A. B., Ph. B. and B. S. courses, per term..	25.00
Tuition, Engineering courses, per term.....	40.00
Graduate course in Electrical Engineering, per term	50.00
Room rent, per year, North College.....\$50. to	60.00
South College, per year.....	60.00
Incidental fee, for maintenance of grounds and public rooms, use of library, gymnasium, etc., per term	8.00
Graduation fee, including diploma.....	15.00
Chemical laboratory fees:	
Required course, No. 1 or No. 1a, per term...	8.00
Required course, No. 2, in Civil, Sanitary and Electrical Engineering, Junior year.....	15.00
Required course, No. 5, in Sanitary Engineering, Senior year.....	15.00
Elective courses, No. 2, No. 3 or No. 4, per term	15.00
Electrical Engineering laboratory fee, per term .....\$2.00 to	10.00
Biological laboratory fees:	
Required course, No. 1, per term.....	2.00
Required course, No. 5, per term.....	3.00
Elective courses, No. 2 or No. 3, per term.....	6.00
Physical laboratory fees:	
Required course, No. 2, per term.....	4.00
Elective course, No. 1a, per term.....	5.00
Conditions examination fee.....	2.00
Fee for certificate of work done.....	2.00
Fee for certificate of graduation.....	1.00

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Students who take part of their Senior year's work at the Albany Medical College as provided on page 64 are charged

\$125 for the year's tuition, \$50 to be paid to the Treasurer of Union College and \$75 to the Treasurer of the Albany Medical College.

Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.

No deductions are made for

It is the custom of the student body to levy an annual campus tax of eleven dollars, five dollars of which is payable at the beginning of the fall term, three dollars at the beginning of the winter term, and three dollars at the beginning of the spring term. This money is used for the support of the different branches of athletics consisting at present of foot ball, base ball, basket ball and track.

mitories should make early application to Charles B. Pond, Assistant Treasurer. On application, a list of rooms, giving location and price, will be furnished. It is very desirable that students about to enter College should secure their own room-mates before the College year opens. When this is not done the men will be located in the order of applica-

### EXPENSES

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Matriculation fee.....	\$5.00
Tuition, A. B., Ph. B. and B. S. courses, per term..	25.00
Tuition, Engineering courses, per term.....	40.00
Graduate course in Electrical Engineering, per term	50.00
Room rent, per year, North College.....\$50. to	60.00
South College, per year.....	60.00

Fee for certificate of work done.....	2.00
Fee for certificate of graduation.....	1.00

---

Students who take part of their Senior year's work at the Albany Medical College as provided on page 64 are charged



\$125 for the year's tuition, \$50 to be paid to the Treasurer of Union College and \$75 to the Treasurer of the Albany Medical College.

Tuition and other fees are due on the first day of each term.

Students must conform to the rules of the Treasurer's office regarding registration at the opening of each term, and will not be admitted to any classes or laboratories until the required fees are paid.

No deductions are made because of absence from college.

No part of a term bill will be refunded for any cause.

Damage done by students to College property will be charged to their account.

No degree, certificate or dismissal will be given to any student until his bills are paid.

Board can be procured for \$4 to \$5 a week.

### College Rooms

The College has two steam heated dormitories, accommodating ninety students. Most of the rooms are arranged in suites of two, and all are unfurnished; they are rented at prices varying from \$50.00 to \$60.00 per year for each student occupying a room. The rooms are cared for by competent persons, employed and paid by the College. No room is secured until a lease is signed and filed in the College Office. A student must occupy the room for which he signs, as transfers are not allowed. Each occupant of a College room will be held responsible for any damage done to the room. Students about to enter College who wish rooms in the dormitories should make early application to Charles B. Pond, Assistant Treasurer. On application, a list of rooms, giving location and price, will be furnished. It is very desirable that students about to enter College should secure their own room-mates before the College year opens. When this is not done the men will be located in the order of applica-

tion. At the end of the College year students giving up their rooms for any reason whatsoever must remove all furniture and property from their rooms not later than the Saturday following Commencement Day, as after this time the dormitories will be closed until the Saturday before the first registration day of the fall term. The dormitories will also be closed during the Christmas recess.

Students leaving property in their rooms during the vacations do so at their own risk.

### Employment Committee

A Committee of the Faculty has been appointed to give assistance to students who desire employment for the purpose of meeting the expenses of a college education. It has been found that many opportunities for work exist in Schenectady by which students may earn from \$2 to \$4 per week, during term-time, without seriously interfering with their college studies. A considerable number of students meet the expense of board by acting as waiters, at the noon hour, at the large restaurant connected with the works of the General Electric Co. Others find employment as clerks in stores on Friday evenings and Saturdays; others in caring for furnaces and in other work about private residences. Applications for the assistance of the committee may be addressed to the Chairman, Prof. James H. Stoller.

## SCHOLARSHIPS

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Funds given especially for this purpose enable the College to offer aid to a number of students each year, as follows:

### General Scholarships

Available for students in the A. B., Ph. B. and B. S. courses

Scholarships covering a part or the whole of tuition charges are granted to students upon the following conditions:

1. The declaration of a purpose to remain in Union College until graduation. (Credentials necessary for admission to another college will not be given to any scholarship student until he has repaid to the college treasury the full amount of scholarship aid received.)
2. An acknowledgment that the aid received is regarded as a debt of honor, to be paid as soon as possible after leaving college.
3. The presentation of satisfactory evidence of financial need.

Scholarship aid will be withdrawn temporarily upon the failure of the student to be sustained in any subject, or upon his failure to maintain an average grade of eighty per cent. in the studies of any term, and after it has been withdrawn for three successive terms it will not be renewed.

Any serious breach of college discipline, evidence of moral delinquency, or repeated unnecessary expenditures will also result in the withdrawal of scholarship aid.

Application blanks will be provided by the President or Dean upon request.

### John David Wolfe Memorial Scholarships

The income of a Fund of Fifty Thousand Dollars established by the generosity of Miss Catharine Lorillard Wolfe is designed to aid students from the Southern States.

The scholarships are governed by the conditions named above.

Application blanks will be provided by the President or Dean upon request.

### Levi Parsons Scholarships

A generous benefaction by the late Hon. Levi Parsons, of Gloversville, N. Y., maintains several scholarships in each class, yielding about one hundred and fifty dollars a year, each; this provides for tuition and a money payment each term.

Among applicants, preference is given:

First, to blood relatives of the founder, bearing his name and living in the county of Fulton, Montgomery or Hamilton, in the State of New York, and especially to those bearing his name and living in Gloversville or Johnstown, Fulton County.

Second, to applicants living in the following places, according to the following order:

1. The city of Gloversville, Fulton County.
2. The city of Johnstown.
3. The township of Johnstown.
4. The county of Fulton.
5. The adjoining counties of Montgomery and Hamilton.
6. To blood relatives living in any other part of the United States.

Nomination to scholarships is made by the Board of Directors of the Gloversville Free Library; and the nominees must pass satisfactory examinations at the College. Applications are received by the Directors of the Gloversville Free Library, Gloversville, N. Y.

These scholarships are governed by the conditions named on page 117.

### Thomas Armstrong Scholarships

The late Thomas Armstrong of Plattsburgh, N. Y., provided for the grant of scholarships to residents of Clinton County, sons of practical farmers. Nominations to these scholarships are made by the Board of Supervisors of Clinton County, and the yearly value of each scholarship is not to exceed two hundred dollars.

### R. C. Alexander Prize Scholarship

The sum of four thousand dollars has been given in memory of the late Robert Carter Alexander, of the class of 1880, and a life trustee of the College, to be devoted to the establishment of a scholarship for the encouragement of classical studies.

The income of this fund, amounting to two hundred dollars per year, will be awarded as a prize scholarship, upon the following conditions:

#### Conditions governing the award of the R. C. Alexander Prize Scholarship

1. Candidates must be students in the Classical course, and of approved moral character.
2. They must be free from conditions and must have obtained an average of at least eighty per cent. in the studies of the first two terms of the Freshman year.
3. They must pass successfully a special examination at the close of the Freshman year in each of the following subjects: Latin, Greek, Mathematics, English Composition, and either French or German. These examinations will be based upon the work of the Freshman year.
4. The award will be made to the candidate obtaining the highest general average in these examinations and in all the previous work of his college course.\*

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\*This scholarship is now held by Elmer Wallace K. Mould, of the class of 1907.

5. The Prize Scholarship will be forfeited upon evidence of moral delinquency, or upon failure to maintain an average grade of ninety per cent. in the work of any subsequent term. The scholarship, once lost, cannot be regained, but will be awarded, upon the above conditions, to a student in the next entering class.

6. All questions pertaining to the administration of this scholarship will be determined by a committee composed of the President of the College, the Chairman of the Scholarship Committee of the Faculty, and a member of the Board of Trustees.

### **Horace B. Silliman Scholarships**

Three scholarships have been founded by the Hon. Horace B. Silliman, class of '46, giving to each recipient the income from two thousand dollars (\$2,000) annually.

These scholarships are to be awarded to active members of the college Young Men's Christian Association by a Committee composed of the President, the Dean, and the President of the Young Men's Christian Association, under such rules and conditions as shall be determined by such Committee, preference being given to students in the Classical course.

The award is made to one student annually at the close of the Freshman year.

### **Law School Scholarships**

Applicants for these scholarships, described below, must register at the College office by May 1st of Senior year.

### **John K. Porter Memorial Scholarships**

A fund given by Mrs. John K. Porter, in memory of her husband, is designed to assist students who, after graduating from college, pursue the study of law. The fund provides,



at present, for three scholarships of ninety dollars each. The awards will be made at Commencement to Seniors chosen by the Faculty.

#### **Gilbert M. Speir Memorial Scholarship**

A fund given by Mrs. Glover C. Arnold, in memory of her father, the late Judge Gilbert M. Speir, provides another scholarship for students of law who go from Union College to the Albany Law School, another department of Union University.

The sum of ninety dollars will be awarded at Commencement to the Senior chosen by the Faculty, the choice being made on the basis of excellence in historical studies.



## PRIZES

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### Blatchford Oratorical Medals

The Hon. Richard M. Blatchford, LL. D., of New York city, founded oratorical prizes, consisting of two gold medals of the value of the interest on \$1,000, which are given to the two members of the graduating class who deliver at Commencement the best orations, "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals are awarded by a committee appointed by the Trustees, and are presented at the close of the exercises.

### Warner Prize

The Hon. Horatio G. Warner, LL. D., of Rochester, N. Y., founded an annual prize, consisting of silver plate of the value of \$28, to be presented at Commencement to the "graduate of Union College, Classical course, who shall reach the highest standing in the performance of collegiate duties, and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize is awarded by the Faculty.

### Ingham Prize

The Hon. Albert C. Ingham, LL. D., of Meridian, N. Y., founded an annual prize of the interest of \$1,000 (in the form of plate, or medal, or money, or both medal and money, as preferred), to be awarded at Commencement to that Senior connected with the College for not less than two years who shall offer the best essay on one of two assigned subjects in English Literature or History.

The essay must be typewritten, and must contain not less than 4,000 nor more than 4,500 words. Its signature (fictitious) and the writer's real name must be enclosed in a

sealed envelope; the signature and the name of the prize being given on the outside. The essay, with the note, must be presented by noon on the fifteenth day of May.

### Allen Essay Prizes

The Hon. William F. Allen, LL. D., of Oswego, N. Y., established a fund of \$1,000, the interest of which is devoted to prizes for the best three essays on any subject, submitted by members of the Senior class.

The essay must be typewritten, and must contain not less than 2,500 nor more than 3,000 words, and must be signed and presented (with note, as in the case of the Ingham Essay) by noon on May 15th. The prizes are awarded at Commencement.

### The Rankine Prize for Extemporaneous Speaking

A prize of \$50 in money is awarded to that member of the College who shall deliver the best extemporaneous speech at a public competition to be held in Commencement week in each year. The award is made by a committee, and is based on the following considerations: (1) The appropriateness and correctness of the subject matter; (2) the logical force of the argument; (3) the excellence of the style; (4) the grace and effectiveness of the delivery. All students in regular standing are eligible. The number of competitors is, however, limited to ten.

### Oratorical Prizes

Prizes are presented at Commencement to the two Juniors and the two Sophomores who deliver the orations best in composition and delivery on the occasion of Prize Speaking in Commencement week. Four Juniors and four Sophomores are selected for this competition by a committee of the Faculty on the fifteenth of April. Candidates must be in full standing on appearance before the committee.

**Allison-Foote Prize**

Founded by George F. Allison, of New York city, and Wallace T. Foote, of Port Henry, N. Y., for the encouragement of debate in the Literary Societies. The prize consists of \$100 in cash, and is to be awarded as the result of a public competition between representatives of the Adelphic and Philomathean Literary Societies. Fifty dollars will be awarded to the society presenting the strongest argument. The remaining \$50 will be awarded to the debater who makes the best single speech, regardless of his society relations. Contestants must have engaged in at least ten debates in their respective societies during the college year immediately preceding. All further details are to be left to the determination of a committee, consisting of the President, the Dean of the College, and the Professor of Rhetoric.

**Daggett Prize**

In 1899 Miss E. Josephine Daggett bequeathed to Union College the sum of \$1,000, the interest of which is devoted to a prize for conduct and character, without respect to scholarship, to be given at Commencement to a Senior who shall have passed through a full course of four years at the College.

## DEGREES AND HONORS

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The candidate for a degree must have paid all dues to the College Treasurer, and returned all books borrowed from the College Library; he must also attend the conferring of Degrees, or be expressly excused therefrom. The candidate for a bachelor's degree must have entered college before the end of the first Senior term.

### Degrees for Resident Study

The degrees of the College are conferred by authority of the Board of Trustees upon candidates who have successfully completed courses of resident study, as follows:

#### The Bachelor's Degree

The degree of Bachelor of Arts will be conferred upon candidates who have successfully completed Course 1, page 62; the degree of Bachelor of Philosophy, upon those who have successfully completed Course 2, page 62; the degree of Bachelor of Science, upon those who have successfully completed Course 3, page 62; the degree of Bachelor of Engineering, upon those who have successfully completed Course 4, 6 or 7, pages 62, 63; the degrees of Bachelor of Engineering and Bachelor of Philosophy, upon those who have successfully completed Course 5, page 63.

#### The Master's Degree

The degree of Master of Civil Engineering will be conferred upon candidates who have successfully completed Course 8, page 63; the degree of Master of Electrical Engineering, upon those who have successfully completed Course 9, page 64.

### Degrees for Non-Resident Study

The degree of Master of Arts or of Master of Science will be given to graduates of Union College who have been registered as candidates for the degree not less than two years, have completed definite courses of advanced study in two departments, and have submitted a satisfactory thesis and passed satisfactory examinations. The total amount of work done is intended to be the equivalent of one year of resident study.

A year of resident study in any non-professional graduate school, approved at the time of registration by the two departments concerned, will be accepted instead of the two years' study above mentioned on fulfilment of the same conditions regarding thesis and examinations.

Each candidate for this degree must register his name, address, and the two departments chosen, with the Dean of the College not later than the fifteenth of October of the year for which he desires registration.

The thesis must be presented to the Dean by May 1st for submission to the Faculty in time to provide for all necessary examinations before commencement.

A fee of \$20 is charged, which covers examinations and diploma; of this amount \$10 is payable at the time of registration and \$10 at the time of the final examinations.

### Honors

All commencement prizes are limited to A. B., Ph. B., or B. S. students who have entered at or before the beginning of the Senior year, and who are in full standing at the close of the second term; and to Engineering students entered likewise and in full standing at the close of the second term, in both the Engineering course and the English department of the B. S. or Ph. B. course.

### Commencement Appointments

These honors are assigned to ten Seniors on the basis of scholarship, as stated under Standing, page 110. Provi-

sional appointments are made at the close of the second term Senior, and become final if those who receive them retain the same relative rank to the end of their course. Under present regulations, no other persons can become competitors for the Blatchford Oratorical Medals.

Seniors not in full standing at the close of the second term shall be considered ineligible to a Commencement appointment.

Places gained as the result of the third term's work shall be on the excused list, unless ordered otherwise by special vote of the Faculty.

### The Valedictory

This honor is awarded to the Senior of highest standing among the ten receiving Commencement appointments.

### Special Honors

Special Honors are also given at graduation in each of the following subjects: Greek, Latin, English Language, English Literature French, German, Mathematics, Physics, Chemistry, Biology, Economics, History, Sociology and Philosophy. The work required in each case will be equivalent of three terms of class-room work of two hours per week each, and will be outside of the prescribed or elective courses. The candidate for Special Honors must apply to the head of the department in which he proposes to take Honors not later than the first Monday of the Spring term of the Junior year. He must have attained in all the studies of the department in which he tries for Honors a rank of not less than ninety per cent. of the maximum. The evidence that he has successfully completed the extra course prescribed for him must be submitted not later than June 1st of the Senior year to the Faculty, who shall decide in each case whether the work done is worthy of an Honor. The Honors attained are stated in the diploma, and the names of the students who take Honors are printed on the Commencement programme.



### **Phi Beta Kappa Society**

At the end of the third term of the Senior year, one-third of the members of the graduating class in the Classical course, candidates for the degree of Bachelor of Arts, may be elected to membership in the Phi Beta Kappa Society. The election is based upon scholarship and character and is given, as a rule, to the men who stand highest in scholarship in their class.

The Alpha of New York Chapter was established in 1817; and ever since that time election to the society has been one of the highest distinctions to be gained by scholarship.

### **Sigma XI**

Election to the honorary scientific Society of Sigma XI, is one of the honors open to Seniors of marked ability in the Scientific and Engineering departments. Membership is confined to the Faculty, Senior candidates for graduation, and Alumni. The election occurs during the latter part of the Senior year and selections are made on the basis of high general scientific or engineering ability and particularly as a mark of promise of ability in research and independent work.

The Society was founded at Cornell University in 1886 and has chapters at more than twenty of the leading colleges and universities of the country. The Union chapter was established in 1887, since which time about one hundred members have been elected by this chapter.



## DEGREES CONFERRED

AT THE

ONE HUNDRED AND ELEVENTH ANNUAL  
COMMENCEMENT

June 12, 1907

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Honorary

## LL. D.

Henry M. Leipziger.....	New York
Alexander E. Orr.....	Brooklyn
Andrew H. Smith.....	New York
Joseph E. Ransdell.....	Lake Providence, La.

## D. D.

John R. Harding.....	Utica
Rockwell Harmon Potter.....	Hartford, Conn.

## Sc. D.

George A. Hoadley.....	Swarthmore, Pa.
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## A. M.

Lewis S. Chanler.....	Barrytown
Norman E. Webster, Jr.....	Washington, D. C.

## In Course

## A. M.

Everett J. Best, 1902.....	Enosburg Falls, Vt.
Archibald Hamilton Rutledge, 1904.....	Mercersburg, Pa.

**M. E. E.**

C. C. Batchelder.....Schenectady

**B. S.**

Charles Newman Waldron.....Detroit, Mich.  
(as of the class of 1906)

**Class of 1907****A. B.**

George Burton Noble.....Jonesville  
Lewis Stewart Parsons.....Liberty  
Albert Huntley White.....Manchester, N. H.

**Ph. B.**

Raymond S. Bennett.....Schenevus  
Jesse Abram De Mey.....Sodus  
Fred Girvin.....Schenectady

**B. S.**

Harold Gardiner.....Hadley  
Dudley Toll Hill.....Schenectady

**B. E.**

Andrew Ordell Avery.....Delanson  
Howard Elmer Bishop.....Sayre, Pa.  
James G. Brennan.....Albany  
Arthur Farrington Blinn.....New York City  
Hervey Edwin Butcher.....Oneida  
Herbert Edward Cantwell.....St. Simons Island, Ga.  
Hugh Garnett Davis.....Lynchburg, Va.  
Richard Sylvester Dillon, Jr.....Rensselaer  
Nicholas V. V. Franchot, 2d.....Niagara Falls

Earl Ewan Harvey.....	Schenectady
Gordon Russell Langley.....	Schenectady
Walter T. McIntosh.....	Buffalo
Frank Leslie Moore.....	French Mountain
Fred Munk.....	Rockville Centre
Frederick Whitman Newton.....	Buffalo
Alexander Joseph Nicht, Jr.....	Auburn
D. Henry Osborne, 2d.....	Victor
Ernest Baxter Osborne.....	Chicago, Ill.
Richard Milton Pyles.....	Brazil
Rollin D. Reed.....	Binghamton
Rubem C. Rodrigues.....	Brazil
Ralph Winne Stearns.....	South Berlin
Peter Willoughby Traynor.....	Owego
Ralph Trumbull.....	Johnstown
Mason William Wadsworth.....	Binghamton
Charles Ray Waters.....	Avoca
William Earl Weller.....	Schenectady

## AWARDS

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### Valedictory

Fred Girvin.....Schenectady

### Commencement Orations

Raymond S. Bennett.....Schenevus

Harold Gardiner.....Hadley

Lewis Stewart Parsons.....Liberty

Albert Huntley White.....Manchester, N. H.

### Engineering Theses

Andrew Ordell Avery.....Delanson

Hugh Garnett Davis.....Lynchburg, Va.

Alexander Joseph Nicht, Jr.....Auburn

D. Henry Osborne, 2d.....Victor

Ralph Winne Stearns.....South Berlin

### Special Honors

In Latin.....Fred Girvin

In French.....Raymond S. Bennett

In Mathematics.....Alexander Joseph Nicht, Jr.

### Blatchford Oratorical Medals

#### For Seniors

1st. ALBERT HUNTLEY WHITE

2d. FRED GIRVIN

### Ingham Prize

#### For Seniors

ALBERT HUNTLEY WHITE

**Allen Essay Prizes**

For Seniors

- 1st. DUDLEY TOLL HILL
- 2d. ALBERT HUNTLEY WHITE
- 3d. LEWIS STEWART PARSONS

**Daggett Prize**

CHARLES NEWMAN WALDRON

**Junior Oratorical Prizes**

- 1st. THOMAS EDWARD HANIGAN
- 2d. ARTHUR BEACH KING

**Sophomore Oratorical Prizes**

- 1st. ELMER WALLACE K. MOULD
- 2d. ROBERT LEONARD BRUNET

**Allison-Foote Prizes**

Won by the Adelphic Society  
and

ARTHUR BEACH KING

Class of 1907

**R. C. Alexander Prize Scholarship**

ELMER WALLACE K. MOULD

Class of 1909

**John K. Porter Memorial Scholarships**

LEON RAY LEWIS

HERRICK MCCLENTHEN

ALBERT HUNTLEY WHITE

## Gilbert M. Speir Memorial Scholarship

DUDLEY TOLL HILL

## The Rankine Prize for Extemporaneous Speaking

MARTIN HENRY WEYRAUCH

## Phi Beta Kappa

From Class of 1905

MORRIS THOMAS RAYMOND

From the Senior Class

LEWIS STEWART PARSONS

## Sigma XI

From the Senior Class

ANDREW ORDELL AVERY

HOWARD ELMER BISHOP

HUGH GARNETT DAVIS

FRED GIRVIN

ALEXANDER JOSEPH NICHT, JR.

D. HENRY OSBORNE, 2d

WILLIAM EARL WELLER

SCHOOL OF ENGINEERING  
UNION COLLEGE  
SCHENECTADY, NEW YORK



## FACULTY

---

GEORGE ALEXANDER, D. D.

President ad interim

OLIN H. LANDRETH, A. M., C. E., Sc. D.

Professor of Civil Engineering

CHARLES P. STEINMETZ, A. M., PH. D.

Professor of Electrical Engineering

BENJAMIN H. RIPTON, PH. D., LL. D.

Dean and Professor of History and Sociology

WILLIAM WELLS, PH. D., LL. D.

Professor Emeritus of Modern Languages and Literature

SIDNEY G. ASHMORE, A. M., L. H. D.

Professor of the Latin Language and Literature

THOMAS W. WRIGHT, A. M., PH. D.

Professor Emeritus of Mathematics

FRANK S. HOFFMAN, A. M., PH. D.

Professor of Mental and Moral Philosophy

JAMES H. STOLLER, A. M., PH. D.

Professor of Biology and Geology

EDWARD E. HALE, JR., PH. D.

Professor of the English Language and Literature

HOWARD OPDYKE, A. B.

Professor of Physics

EDWARD ELLERY, A. M., PH. D.

Professor of Chemistry

FRANK COE BARNES, A. M., PH. D.

Professor of Modern Languages

HORACE GRANT McKEAN, A. M.

Professor of Rhetoric and Public Speaking

JOHN LEWIS MARCH, A. M., PH. D.

Adjunct Professor of Modern Languages

ELMER E. F. CREIGHTON, B. S., E. E.\*

Assistant Professor of Electrical Engineering

JOHN W. HUGHES, B. S. in C. E.

Assistant Professor of Civil Engineering

OLIN J. FERGUSON, B. S. in E. E.

Assistant Professor of Electrical Engineering

DANIEL A. YOUNG, B. S. in C. E.

Instructor in Civil Engineering

STEWART A. McCOMBER, A. M., M. D.

Instructor in Physical Culture

JAMES H. CUNNINGHAM, B. E.

Instructor in Electrical Engineering

MORLAND KING, B. E., M. E. E.

Instructor in Electrical Engineering

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\*Absent on leave.

## UNION COLLEGE

CYRUS A. MELICK, C. E.

Instructor in Civil Engineering

WILBERT A. GARRISON, A. M.

Instructor in Engineering Mathematics

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Instructor in Engineering Drawing

OSCAR VON VOIGTLANDER, M. E.

Instructor in Civil Engineering

DAVID HUTCHISON, A. M., B. D.

Instructor in History

FRANK W. SMITH

Instructor in Modern Languages

ALBERT S. EASTMAN, B. S.

Assistant in Chemistry

E. J. BERG

Lecturer on Electrical Engineering Practice

M. F. WESTOVER

Lecturer on Organization and Management of Corporations

J. L. R. HAYDEN

Lecturer on Arc Lighting and Photometry and  
Supervisor of Electr. Eng. Thesis work

## THE ENGINEERING SCHOOL

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**Introductory.** The charter of Union University brings together under one corporate name and administration Union College, located at Schenectady, N. Y., and the Law School, the Medical College, the Dudley Observatory and the College of Pharmacy, all located at Albany, N. Y.

The Engineering School forms a part of Union College. Its connection with the regular college courses and with the other members of the university group is considered an advantage, as it furnishes opportunities for general culture not usually available in a purely technical school.

**Historical.** When Union College was chartered, in February, 1795, the only American colleges west of the Hudson River were William and Mary, Princeton, Hampden-Sidney, Rutgers and Dickinson. These, as well as the New England colleges, were all denominational; Union was the first strictly non-sectarian American college, and its name was inspired in part by this novel characteristic. The first full professorship in natural science in an American college was founded at Union and it is a matter of special scientific interest that Prof. F. R. Hassler was called from this chair in 1811 to establish the United States Coast Survey.

The engineering school of Union College is one of the oldest technical schools of the country. Founded in 1845 with Prof. William M. Gillespie at its head, it at once took high rank, and for many years was one of the few engineering schools in America. From the first it appears to have been the evident policy of the school to adapt the thorough training of L'École des Ponts et Chaussées, of Paris, France, where Prof. Gillespie had finished his technical education, to the demands of professional practice in a vigorous new country, where resources and opportunities were abundant, and where capital and professional precedent were wanting. From the characteristic tendencies impressed on the school at

its foundation it has never departed, although it has endeavored to keep pace with the development in American technical education and with the increased demands on professional training. For many years Civil Engineering only was taught; then, as the principles of modern sanitary science came to be better understood and the possibilities of their further development and their utilization as life-saving agencies were discerned, a course in Sanitary Engineering, was established; and more recently a course in Electrical Engineering, just now being extended, was added.

During its whole history the school of engineering at Union has stood for broad, fundamental training rather than for narrow specialization and during recent years, since its advanced entrance requirements have made room in the course, increased time and attention have been given to culture studies and to a larger proportion of academic training.

**Local Advantages.** Schenectady is a peculiarly favorable location for an engineering school. The city is on the Mohawk River, and is intersected by several steam railroads, a number of interurban electric trolley lines and the Erie Canal, furnishing many bridges and other engineering works. At Schenectady are also located the works of the General Electric Company and of the American Locomotive Company, each an extensive and leading industry in its respective line. Among other interesting engineering features may be mentioned the city grade-crossings improvement now approaching completion at a cost of a million dollars, and the city waterworks, which contain in their outfit a system of ground-water wells and a recently installed set of electrically-driven multiple-stage centrifugal pumps, of twenty million gallons daily capacity. The neighboring cities of Albany, Troy and Cohoes, as well as the surrounding territory, offer numerous examples of good engineering and many features of value as aids in engineering training. Among these may be mentioned the Scientific Departments of the State Government at Albany, including the headquarters of the State En-

gineer's Department and of the new Barge Canal; the State Library; the Albany City Water Filtration Plant; at Troy the Burden Iron Works; the Gurley Engineering Instrument Manufactory; at Watervliet the United States Arsenal and Gun Factory; the Water Power Developments and Electric Power Transmission Plants at Mechanicville and Spier Falls; the Hydraulic Cement Works at Glens Falls and at Howe's Cave; and the Modern Sewage Disposal System at Saratoga Springs. It is expected that the new barge canal will pass the Cohoes Falls by a flight of locks and will pass Schenectady by a system of locks and dams in the Mohawk River, calling for extensive and interesting engineering operations. All these sources of aid are utilized in the work of the school.

**General Education and Technical Training.** In the training of a young man for his professional work two distinct methods are open. One is to separate his professional work from his general educational training and to complete the latter before the former is commenced. This is the plan followed in the professional schools of theology, law and medicine. The other plan is, after the student has reached a certain point in his studies, to have him carry forward at the same time his general education and his technical training. This plan is the one generally followed in engineering schools, as it has been found by engineering educators and professional engineers to yield better results in practice than the former plan. The point selected at which the technical training shall commence is the beginning of the college course, the time of which is divided between general studies and technical studies. In the Union College engineering courses the time allotted to the two divisions is about equal, though the two are carried on simultaneously, the general training receiving, however, more time in the early part of the course and less in the latter part.

**Alternate Courses of Study.** Four undergraduate courses of study in engineering are offered, three extending through four years and one extending through six years:—(1) A four-



year course in general engineering, which is intended to give the basis of a broad engineering education, including the fundamental principles underlying the special branches of the profession; (2) A four-year course in sanitary engineering which differs from the general engineering course by substituting special work in sanitary subjects for some of the general engineering studies; and (3) a four-year course in electrical engineering, in which the last two years are devoted to essentially mechanical and electrical engineering subjects.

These three courses are identical during the first two years, the sanitary course differing slightly from the general during the last two years, while the electrical course in its last two years differs widely from the other courses. The degree of Bachelor of Engineering (B. E.) is given for the successful completion of any one of the above three courses.

A six-year course in general engineering is also offered comprising the above four-year course in general engineering, course (1), and the regular four-year Latin-scientific course of the Academic Department, with the subjects of the two courses properly interwoven during each term. The course thus offers a combined college and technical training with the subjects of the two properly correlated. The degrees of Bachelor of Engineering (B. E.) and of Bachelor of Philosophy (Ph. B.) are given on the satisfactory completion of this course.

In addition to the above undergraduate courses in engineering, two post-graduate courses and degrees are offered:

The degrees of Master of Civil Engineering (M.C. E.) and of Master of Electrical Engineering (M. E. E.) are given on the satisfactory completion of one-year graduate courses of study in Civil Engineering and in Electrical Engineering, respectively.



## REQUIREMENTS FOR ADMISSION TO THE ENGINEERING SCHOOL

### Common to all Engineering Courses

**General Conditions for Admission.** The general conditions governing admission to the Engineering School are stated in detail on page 65.

**Requirements for Examination.** Candidates for admission to the Freshman class in any of the engineering courses are required to pass satisfactory examinations in, or present approved certificates covering, the following subjects:

English Literature, Arithmetic, Algebra, Plane and Solid Geometry, Plane Trigonometry, Physics, German or French, History of the United States, Modern Geography, and Physiology, as given in detail on pages 67-72.

Candidates for admission to the Freshman class of the six-year undergraduate course are required, in addition, to pass a satisfactory examination or present approved certificates in Latin (3) page 68.

## EXPENSES, TERMS AND VACATIONS

For information regarding expenses, terms and vacations, see pages 122-123 and pages 7-9.

## STUDIES OF THE FOUR COURSES

**Outline Description.** The following is an outline of those studies which in general are common to the three four-year courses in General, Sanitary, and Electrical Engineering and to the six-year General Engineering and Latin-Scientific course. The studies which are peculiar to each are outlined under the separate departments.

Following the distinction between the two kinds of training above mentioned, the studies here outlined are arranged under the two heads of General Studies and Technical Studies.

### General Studies

**Physics.** The instruction in physics comprises a series of lectures on experimental physics, accompanied by classroom and laboratory work. Physical laboratory work is required of all engineering students. See also pages 94-96.

**Chemistry.** General chemistry is taught by lectures, recitations and laboratory work during the Freshman and Sophomore years and laboratory work in qualitative analysis is continued through the first term of the Junior year. Sanitary engineering students, in addition to the above, take chemical laboratory work during the first and second terms of the Senior year. See also pages 96-98.

**Astronomy.** The instruction in astronomy includes physical astronomy, spherical astronomy and the theory of astronomical instruments. These studies are preparatory to the work in astronomical surveying and geodesy given in the general engineering course. In the electrical engineering course the work is confined to descriptive astronomy.

**Biology.** Physiology is a required study in each of the three engineering courses. Structural botany is given in the general and sanitary courses, and bacteriology is given in the sanitary course. Structural botany includes the microscopic study of the vegetable cell, the tissues and the tissue-system of the higher plants with special reference to the use of woods in the constructive arts. In bacteriology some of the common bacteria of water, air and soil are studied according to the methods of modern bacteriological work. The accompanying lectures treat of bacteria in regard to their place and role in nature and their relations to sanitary science. See also pages 98-100.

**Geology** (not required in the electrical engineering course). This work comprises a course in economic geology, which includes the general principles of geology and a discussion of the occurrence and distribution of minerals and mineral materials for construction in the United States. See also pages 98-100.

**English.** The instruction in English aims at a general acquaintance with English literature and a correct, clear and forcible use of the language. Rhetoric is studied throughout the Freshman year. In the first term a summary review of diction is given. In the second and third terms more attention is given to the development of thought by work upon kinds of composition and the paragraph. In the Sophomore year English Literature as represented by the work of the essayists and by Shakespeare is studied. In the Senior year one of the required essays of each term will be upon a technical subject prepared under the direction of the professor of Civil Engineering, the object being to give the engineering student practice in the preparation of clear, concise and systematic reports on engineering subjects. See also pages 83-86.

**Modern Languages.** All engineering students at the time of entrance must have had two years of either French or German. After entering they are required to pursue French and German each for one year. This will be advanced work for the language offered at entrance, and elementary work in the alternate language not offered. Some work in scientific French and scientific German is done during the latter part of the course. See also pages 77-82.

**History and Economics.** American history throughout the Junior year and economics during the first term of the Senior year are required of all general engineering students.

**Sociology, Political Science and International Law.** General engineering students who elect "Option B" in engineer-

ing administration are required to have sociology during the last two terms of the Junior year, political science during the first two terms of the Senior year, and international law during the last term of the Senior year.

**Physiology and Physical Training.** See pages 100-102.

**Studies of the Six-year Engineering and Latin-Scientific Course.** For the studies of this course not described above, see the curriculum on pages 180-183 and the detailed descriptions as follows:—

For Latin, see page 76.

For English Literature, see page 83.

For Rhetoric, see page 85.

For History and Sociology, see page 86.

For Logic and Psychology, see page 89.

For Biology and Geology, see page 98.

**Voluntary Studies.** Any of the studies of the classical course or of the scientific course of the college may be taken by engineering students without extra charge.

### Mathematical and Technical Studies

The following mathematical and technical subjects are included in each of the three engineering courses, and the instruction therein is given in the General Engineering Department.

**Mathematics.** To the engineer the subject of mathematics is essential not only for its disciplinary training, but also for its practical applications and use. Both these features receive due consideration in the teaching of the subjects under this head, especial effort being made to incite the student to independent thinking, and to enable him to apply his knowledge of mathematics to his technical work, at the same time holding him to rigorous methods and logical conclusions.

The following courses are required:

*Algebra*, advanced, including elements of determinants. Downey's *Algebra*. Required of Freshmen. Four hours weekly during first term.

*Plane Trigonometry*. Required of Freshmen in addition to the trigonometry required at entrance. One hour weekly during third term.

*Spherical Trigonometry*. Required of Juniors in the General Engineering Course "Option A," and in the Sanitary Engineering Course. Three hours per week during a part of the third term.

*Analytic Geometry*. Tanner and Allen's *Analytic Geometry*. Required of Freshmen. Four hours weekly during second term, and two hours weekly during third term.

*Calculus*. Murray's *Infinitesimal Calculus*. Three hours week during third term of Freshman year, three hours weekly during first and second terms, and two hours weekly during third term of Sophomore year.

*Analytical Mechanics*. The subjects taught under this head are statics, dynamics, hydro-statics, hydro-dynamics and pneumatics. These studies form the foundation for the technical studies of applied mechanics, strength of materials and stresses in framed structures, all of which are fundamental to one of the chief divisions of an engineer's duties, namely, that of designing. Required of Sophomores. Three hours first term, two hours second term and one hour third term.

**Drawing and Descriptive Geometry.** The instruction in this work extends through the entire course. In the first term of the Freshman year the student is instructed in free-hand drawing and in freehand lettering. In the second term he is instructed in the use of drawing instruments, in orthographic projections and in construction of geometrical problems and instrumental lettering. In the third term Freshman and first term Sophomore he is given practice in plotting sur-



veys made in the field. Further instruction in topographical drawing follows in the first term of the Sophomore year. Descriptive geometry is begun in the second term Sophomore and, in addition to instruction in the theory, some of the most common applications in practice are taught by the use of practical problems. Schroeder's models and the Olivier models, as well as the models of intersections of the Paris Polytechnic School, are freely used. In the third term Sophomore instruction is given in shades, shadows and perspective and in the theories of oblique projections.

**Mensuration and Surveying.** This work is begun in the second term of the Freshman year by the study of pure and applied mensuration, together with the fundamental principles of error, precision and computations, illustrated by practice. In the third term the theory of surveying instruments and operations is taken up and illustrated by field practice with the chain, tape, compass, transit, level and rod. In the first term Sophomore topographical surveying is commenced and instruction and practice are given in the use of the various methods and instruments.

As a preliminary to instruction in each branch of surveying a thorough study of the instruments employed is made, treating their geometrical, optical and mechanical relations; their adjustments and use; and the determination of their instrumental constants, errors and limits of precision. The classes are divided into small sections and directed by the instructors. Office computations, plotting and mapping are made adjuncts of the field surveys.

**Applied Mechanics and Materials.** Applied mechanics is commenced in the first term of the Junior year, and comprises the extension of analytical mechanics and the development of the methods of graphical analysis with their applications to engineering problems, operations and constructions, particularly the treatment of stresses, strains, deflections and deformations in elastic materials and structures due to extraneous forces.

In conjunction with this work is given the study of the production, preparation, strength and physical properties of the various engineering materials, including timber, stones, cement and lime mortar, cast iron, wrought iron and structural steel. Practice in the engineering laboratory is an important adjunct to this study.

This entire division, properly correlated, becomes the foundation of all rational engineering design and construction.

**Engineering Law and Procedure.** During the first and second terms of the Freshman year and the third term of the Senior year a series of lectures is given on topics pertaining to the training and the qualifications of engineers, and to engineering practice. In the Junior and Senior years in "Option B," and in the third term of the Senior year of "Option A," a course is given in the study of the elements of the law and principles of procedure in contracts, agency, corporations, commercial and financial transactions and industrial accounting and of the law relating to land boundaries and titles, water courses and surveys.

**Final Examinations.** During the Senior year a series of final examinations will be held covering the more important subjects of the entire course. The list of subjects in which examinations are to be given during any term will be determined by the faculty.

**Theses.** Each candidate for graduation is required to present on or before the last Wednesday in May of his graduation year a satisfactory thesis on a subject that has been approved by the professors of Civil Engineering or of Electrical Engineering. This thesis must be original in its character and may be either a design for some engineering structure or plant, process or operation, or an independent investigation of some principle, problem or matter of engineering importance. Reviews or copies of existing structures, plants or processes, unless of special educational value or involving original investigation, will not be approved as subjects. This



thesis is to be in a form prescribed at the time of approval of the subject, and is to be bound for deposit in the library of the engineering school, and must be presented in this shape on or before the stipulated date. The subjects, with outlines of the proposed treatment, must be submitted for approval not later than December 1st preceding graduation, and the work on the theses must be presented for inspection and criticism of the professor in charge of the department at intervals during progress.

### Library

The students have the use of the College and Society Libraries. The former contains the Engineering and Scientific Library of the late Professor Gillespie and other valuable technical collections. See page 102.

## GENERAL ENGINEERING DEPARTMENT

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**Two Alternate Courses.** In the four-year general engineering course two alternate courses or options are offered, either of which may be selected by general engineering students at the beginning of the Junior year, and each of which extends through the Junior and Senior years. The first of these alternate courses, designated as "Option A," offers a broad, fundamental, general engineering training such as a thoroughly trained engineer should have before specializing in any of the branches of the profession. The other alternate course, designated as "Option B," while in the main identical with the former, differs from it by omitting some of the more technical subjects, such as stereotomy, kinematics, least squares, sewerage, geodesy and field astronomy, and by substituting therefor, sociology, the elements of law, political science and international law, the principles of finance and financial operations, the principles of business management and accounting, and additional work in history and in engineering law and procedure. The object of this alternate course is to offer to

engineering students an opportunity better to qualify themselves for engineering positions of an executive or administrative character. These two options are also offered in the six-years general engineering course and extend through the fifth and sixth years.

The details of these two optional courses will be found later on pages 175, 176, 182, 183.

In addition to the studies common to all engineering courses previously described on pages 143-150, the following subjects are included in the general engineering course. Unless otherwise stated, the following studies are required in each of the two alternate courses in General Engineering:

**Drawing and Descriptive Geometry (continued).** In the Junior year work in drawing includes machine drawing and the solution of problems in graphical analysis. In the Senior year the subject includes the work in engineering design and construction of the last two terms, and comprises a large amount of structural drawing in the development of the designs of engineering structures. A course in stereotomy and stone cutting is given in the first term Senior, with drawings from the stereotomy models of the Paris Polytechnic School. Practice in blue printing is made a part of these courses.

**Surveying (continued).** Railroad surveying is treated in the third term of the Junior year, and the students are given exercises in the proper field operations on railroad surveys, office and field location and staking out work for construction. The subject of railroad construction and equipment is not treated until the first term of the Senior year.

**Field and Laboratory Practice.** In addition to the weekly field and laboratory exercises throughout the year, all Freshman, Sophomore and General Junior engineering students will be given an uninterrupted fifteen days' course in field-practice and laboratory work supplementary to the studies in which such practice is desirable. The course will begin on the day (Thursday) following Commencement and will continue through that and the two following weeks. The work

will be so selected and arranged as not only to supplement the studies of the year, but also to give instruction and practice in the organization, operation and direction of work conducted by engineering parties. The practice will form a part of the spring term work.

**Astronomy.** A short course in Descriptive and Mathematical Astronomy, occupying, with some preliminary work in Spherical Trigonometry, three hours during the spring term of the Junior year.

**Least Squares, Geodesy and Field Astronomy.** This course is given three hours weekly, during the second and third terms of the Senior year. After a study of the fundamental principles of the adjustment of errors and their use in finding the weights and probable errors and in establishing empirical formulas, a discussion of the figure of the earth, triangulation, base lines, and precise leveling is taken up, accompanied by field work which also includes the determination of time, latitude, and azimuth, with ordinary instruments and with methods and instruments of an observatory.

**Engineering Design.** The course in applied mechanics and materials prepares the student to undertake the study of engineering design proper, which is pursued throughout the Senior year; an important feature of this course is the work in bridges, railroads and water-power developments, architectural engineering, etc. The exercises in this line of work are, as far as possible, chosen from professional practice, and the student is expected to carry out, from assigned data and conditions, the preliminary study, determinations of stresses, types, dimensions and details, and to turn in the results in the form of working drawings, diagrams and memoirs. The course is preceded by a series of lectures on the principles and economics of designing. The department possesses a large collection of drawings and photographs of representative engineering structures from which students can form correct ideas of modern practice in the designing of details and in the methods followed on works of this class.

**Water.** The subject of water is considered from several standpoints. In the first term Junior is given a laboratory course in chemistry, followed by a course in water analysis. In the third term Junior is given a course in hydraulics, followed in the Senior year by a fuller development of the subject as applied to rainfall, run-off and storage of water, in relation both to water power and to potable water supplies. This course is accompanied by a study of the sanitary aspects of the subject of water supply and its preservation from contamination. An outline study is also made of pumping engines.

**Highways.** The study of highways in the first term of the Junior year comprises a consideration of the highway as an element in the transportation system of the State, the principles of its economic location and proper construction, a study of the various modes of construction and the materials employed, its proper maintenance and systems of highway laws and administration.

As a preliminary to the study of highway location as well as of railroad and route surveying, some consideration is given to the principles and fundamental laws of topographical types and forms and their relation to the various modes of earth sculpture.

**Streets and Pavements.** A study of the methods of laying out and grading streets and pavements and of the various street accessories, paving methods and materials and their treatment, with special reference to their economic and sanitary aspects, is also given during the first term of the Junior year.

**Motors and Motive Power.** Following the work in thermodynamics and hydraulics of the third term of the Junior year an outline course in motors and motive power is given in the first and second terms of the Senior year, comprising a study of the sources of demand and supply of power, steam-boilers, steam-engines, steam turbines, water-wheels and turbines,

gas-engines, electric motors and transmission of power by shafting, belting, rope-driving, compressed air and electricity.

**Electrical Machinery and Transmission.** Following the instruction in electricity in the Department of Physics, General Engineering students are given, during the second term of the Junior year, a three-hour course in the fundamental principles and practice of electrical generators, motors, transformers, transmission and instruments.

**Principles of Finances, Business, Accounting.** General engineering students who elect "Option B" are given instruction in the principles of finance and financial operations, the principles of business and of industrial organization, and the principles of accounting and of cost-keeping during the second and third terms of the Senior year.

### Instruments and Apparatus

The department is supplied with field instruments of the best description, comprising a large theodolite, suitable for refined geodetic operations, transits, surveyors' compasses, prismatic compasses, Burnier's compass, solar compass, Y levels, the levels of Troughton, Egault, Lenoir and Burnier; plane tables, sextant, octant, mountain barometers, aneroid barometer and a marine chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie was purchased for the Engineering School.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important:

**The Olivier Collection.** This consists of about fifty models, representing the most important and complicated ruled surfaces of Descriptive Geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved, to which are attached silk threads representing the elements or successive positions of the gener-



atrices of the surfaces. Each of these threads has a weight suspended by it, so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads, still stretched straight by the weights in every position they may take; so that the forms and natures of the surface which they constitute are continually changing, while they always remain ruled surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid, etc.

These models were invented by the late Theodore Olivier while Professor of Descriptive Geometry at the Conservatoire des Arts et Métiers, in Paris. One set of them is now deposited there, and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands, and, after his death, in 1853, retained by his widow till bought of her by Professor Gillespie, in 1855. It is more complete than that in the Paris Conservatoire. It may be worth noticing that the silver plates on the boxes, reading "*Inventé par Theodore Olivier,*" etc., were added by Madame Olivier, at her own expense, after the purchase, as a tribute to the memory of her husband, her own words being, "*Je tenais à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité.*"

Professor Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones, etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal; models illustrating Shades and Shadows.

**Stone Cutting Models** (twenty) in plaster, selected from those of L'École Polytechnique of Paris.

Professor Bardin's models (ten) in plaster, of OBLIQUE ARCHES.

Groined and cloistered arch models (ten) in wood and plaster.

Models of structures in stone, consisting of bridges, culverts, etc.

Winding-stair models in wood and plaster. Full sized models of voussoirs and skew-backs of an oblique arch.

**Models in Topography.** French and German plaster models, giving all the different forms of ground, accompanied by topographical drawings, showing how to represent these forms by contour lines; hatchings and shades from vertical and oblique light; models and maps in colored topography; a large model of Mount Ceniz Pass, showing the wagon road and contour lines.

**Architectural Models.** Models of the five orders of Architecture from L'École des Beaux Arts, Paris; portals; stairs; roofs; walls; buttresses; domes, etc.

**Engineering Models.** Schroeder's models of joints, brick bonds, etc.; spur wheels; bevel wheels; cranes; pile drivers; various forms of water-wheels; pumps; cylinders; valves; eccentrics; etc.; steam engines.

Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full sized model of the liquid vein measured by Poncelet and Lesbros.

Models of bridges of various systems, comprising truss, suspension, tubular and arch bridges; Doyne's Dynamometer Bridge Models showing, by means of dynamometer, strains at different points; models of roof trusses, arranged for using the dynamometer to show the different stresses.

Models of fortifications, illustrating Vauban's system; shot, shell, etc.

Models of culverts, piers, abutments, culvert heads, wing walls, rail sections, etc.

**Maps, Drawings, Etc.** This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections; about fifty thousand engravings, lithographs, photographs and detail drawings of engineering and



architectural structures; working drawings of machines, bridges, buildings, etc.

**Physical Apparatus.** To illustrate the lectures in Physics, the college has an extensive collection of apparatus. This has been secured largely from foreign makers and includes special pieces of apparatus constructed under the direction of the late Professor Foster, besides sets of apparatus of standard patterns by Koenig, Duboscq, Ruhmkorff, and others.

**In Mineralogy.** The Wheatley collection contains nearly 4,000 specimens of minerals, the result of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are, without exception, open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy. Among the rare and valuable specimens are those of Anglesite, Cerusite, Mimetite and Calcuprite, which in American specimens are equaled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blow-pipe examination.

**In Metallurgy.** The College possesses a suite of ores of the useful metals, comprising over 1,000 specimens. These have been arranged to illustrate their mode of occurrence and geographical distribution. In addition are the fluxes, fuels, etc., used in obtaining the metals from the ores, together with the slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces, etc.; also suites of specimens of wood, charcoal, mineral coal, peat, etc., for physical inspection; also specimens of most of the useful alloys.

**In Chemistry.** The chemical laboratory is furnished with tile-top desks and lockers, and all the modern apparatus

necessary for work in general chemistry and qualitative and quantitative analysis. Ample hoods occupy one side of the laboratory, where the student may work with the disagreeable and poisonous gases. In the private laboratory of the professor of chemistry provision is made for any students who may desire to pursue advanced courses, either in volumetric analysis, water and milk analysis, organic chemistry, or any special work in connection with courses of other departments.

A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids; the crude products themselves and the materials used in the manufacture of the alkalis, soaps, matches, black lead, candles, petroleum products; linseed, olive, castor, cottonseed and other oils; paper, porcelain, glass, fire and building brick, mortar and cements, beet and cane sugar, white lead and other paints, etc., etc., form a part of the permanent collections of the department.

## SANITARY ENGINEERING DEPARTMENT

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**General Considerations.** The extensive development of sanitary biology during recent years and the establishment on a firm, scientific basis of the germ-theory of disease have laid a secure foundation for the important specialty of sanitary engineering. Already the practical application of the principles in many lines of public utility, as well as in medicine and surgery, has resulted in a very marked decrease in the annual death rate. The most fruitful line of application of this recent and useful knowledge lies in the intelligent design, construction and operation of municipal public works and of systems of water supply, sewerage and drainage, heating and ventilation of private residences, schools, hotels, hospitals and other public institutions and buildings.

**General Scheme of the Course.** The course in sanitary engineering differs from the general engineering course by

omitting astronomical surveying, geodesy and railroad construction, and substituting therefor sanitary biology, heating and ventilation, house drainage and plumbing, sanitary codes and laws, and an increase in the amount of chemistry and chemical laboratory work.

**Sanitary Conditions of Buildings.** In the first and third term Senior, respectively, are given courses in heating and ventilation and in house drainage and plumbing. The latter course will give special attention to the matter of water supply and of the removal of wastes from buildings in all situations, from the isolated country house to that in a thoroughly drained city.

**Sewerage and Drainage.** The study of the principles and practice of sewerage and sewage disposals is given during the last term of the Senior year. The fundamental sanitary and constructive principles will be developed and a comparative study of the various systems as well as of the details of construction and maintenance receives careful attention. A course of lectures in the third term Senior presents the principles upon which the laws touching the subject of the public health are based and the outlying principles which should govern the preparation of sanitary codes and regulations.

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Correspondence regarding admission to the undergraduate courses should be addressed to the Secretary of the Faculty. Correspondence regarding admission to the graduate course in Civil Engineering may be addressed to

OLIN H. LANDRETH  
Professor of Engineering  
Schenectady, New York

## ELECTRICAL ENGINEERING DEPARTMENT

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A course of instruction in Electrical Engineering was introduced in 1895, and in 1902 was re-organized and made into a separate department of the engineering school under the direction of Professor Charles P. Steinmetz, consulting engineer of the General Electric Company.

The course of studies offered by the Department of Electrical Engineering aims at a thorough and broad scientific education of the prospective engineer, rather than the specific training of a specialist. The instruction, therefore, consists of three classes of studies. The general culture studies furnish such training as is now considered essential for every educated man, as languages, literature, history, etc. Such instruction extends over a large part of the first two years, and is then followed by a broad and general technical education, giving the student the fundamental principles and their application to all branches of engineering. Ultimately follows the specific instruction in Electrical Engineering, which, while it enables the student, after graduation, to enter the field of Electrical Engineering practice in the manufacturing or operating company or consulting engineer's office in a subordinate capacity only, has given him all the necessary requirements to gather in a few years' practice the knowledge needed for independent work of greater magnitude.

The instruction especially aims at a thorough understanding of the fundamental principles rather than a memorizing of numerous facts—that is, aims at quality, and not quantity—and as far as possible in all engineering instruction the subject is brought before the students in three different ways; by a theoretical lecture course with recitations, practical instruction in the electrical laboratory paralleling the lecture course, and, following after this, the application of the knowledge gained in lecture courses and laboratory to calculation and design in the drafting room. Finally, more independent work on the solution of engineering problems is

undertaken by the students. These problems invariably require some research work; the systematic tabulation of the results with original conclusions constitutes the graduating thesis. Throughout the technical course, by work in the laboratory, some familiarity with the apparatus is given to the students before the technical side is taken up in the lecture course, so that when approaching the theoretical studies of electrical phenomena or apparatus the student is already able to appreciate the practical value and importance of the subject with which the theoretical investigations deal.

Through the active interest which the General Electric Company takes in technical education, an arrangement has been effected between the College authorities and the officials of the company by which the students in the Junior and Senior classes are admitted to the company's works at appointed times, under the direction of their instructor, with the privilege and opportunity of studying and inspecting the plant and operations and of being regularly instructed therein. The work has been systematically arranged, and is given simultaneously with the corresponding class and laboratory work, to which it forms an important and valuable adjunct.

### List of Studies—Outline Description

The following list of studies comprises only those subjects of the electrical engineering course which are not required in the other courses, and have, therefore, not yet been described in detail. All the culture studies and most of the general engineering and scientific studies are pursued in common with the students of other engineering branches. Beginning with the Junior year, however, the courses diverge. The electrical engineers take up a number of mechanical engineering subjects and continue them throughout the Junior and first part of the Senior year. In fact, during the Junior year the mechanical engineering work may be considered as constituting the major subject, though a considerable amount of time is also devoted to electrical engineering,



The mechanical engineering subjects not previously described are:

**Hydraulics and Hydraulic Machinery**

**Hydraulic Turbine Design**

**Theory of the Steam Engine**

**Steam Engine Design**

**Thermodynamics, Gas Engine and Steam Turbine**

Other general subjects given only to electrical engineering students are:

**Elements of Civil Engineering.** The work and methods of the civil engineer. This course is given to broaden the ideas of the student, thus enabling the electrical engineer to value properly the labors of his colleagues in this allied department of the profession.

**Engineering Mathematics.** One lecture a week is given throughout the Junior year on the special branches of mathematics most employed in engineering work. It is recognized that mathematics is the foundation of all engineering, and a considerable part of the Freshman and Sophomore years is therefore devoted to the study of mathematics. In addition thereto this course is given specially to train the students in those particular branches of mathematics which are most frequently applied in electrical engineering, and so enable them to handle mathematics as a ready working tool in practical engineering problems. This course is given by Professor Steinmetz, and in 1906-1907 covered the infinite series, its derivation and meaning; the trigonometric series; determination of maxima and minima; the fundamental differential equation of electrical engineering and its integral; empirical curves and their investigation, as the parabolic, exponential and logarithmic function.

The electrical engineering studies include the following:

**Direct Current Circuits and Apparatus.** Students in electrical engineering devote a considerable part of the Junior year to the study of the fundamental principles of the subject. Direct current phenomena are studied first, as this part of the subject is somewhat simpler and is readily brought within the grasp of the average student. This work includes the theory and practice of direct current generators and motors and auxiliary apparatus, taking into account also the principles of design.

**Direct Current Laboratory.** The work under this head is parallel with the foregoing, and includes all standard tests of direct current machines, and is supplemented by numerous experiments arranged with due regard to their general importance and scientific value. The machines with which the student has become more or less familiar in class work are here examined in detail and careful records made of efficiency, regulation, internal characteristics, commutation under varying loads, etc.

**Direct Current Design.** When the foregoing courses have been finished each student is directed to design a specified machine and is required to do this work in class and without other aid than that given by the instructor. Complete calculations, with curves, where necessary, and full working drawings of the machine designed, are required, and credit is given for accuracy, originality and neatness.

**Alternating Current Circuits and Apparatus.** The importance of alternating currents in modern electrical engineering and the complex nature of their phenomena make it essential that a large amount of time be spent in the study of alternating current circuits and apparatus. This work is taken up in the second term of Junior year immediately after the completion of direct current theory and in conjunction with direct current design and is continued throughout the Junior



and during a part of the Senior year. The work included under this head covers the more elementary part of the subject and is made practical by the assignment of a large number of problems to be worked out by the student. It is carried on at the same time with the following course.

**Alternating Current Laboratory.** The work done here in the Junior year consists of an extensive series of experiments corroborating and explaining the theories of the lecture room. The exercises consist in investigation of voltage and current conditions on a variety of combinations of resistance, inductance and capacity in series and in multiple, the exploring of field flux and wave shapes of alternators, and the effect of inductance and capacity on wave shape. Upon entering the Senior year the student is thus equipped with the broad foundation in the underlying principles of electrical engineering, which is absolutely essential to a comprehensive study of the more intricate and special departments of the subject.

**Electrical Engineering Theory.** Here the subject of alternating current phenomena is continued throughout the Senior year. The method of treatment developed by Professor Charles P. Steinmetz is used entirely, and is applied to the different apparatus, as transformers, induction motors, phase and frequency converters and other induction apparatus; alternators, synchronous motors, rotary converters and other synchronous apparatus, etc., which are thoroughly discussed with reference to theory, practical design and operation under varying conditions.

**Electrical Engineering Practice.** This course of lectures is designed to put the student in touch with the most recent developments of advanced engineering practice. It emphasizes the fact that an engineer must be well equipped and resourceful in order successfully to attack new problems. It is an outgrowth of what was formerly known as a Lecture Course by Specialists. This course is to be given in 1907-1908 by Mr. E. J. Berg.

**Alternating Current Laboratory.** In this course, which is parallel with the foregoing, complete tests are made on the apparatus studied, and the characteristics of the various machines are determined. The laboratory work deals with the transformer: ratio, impedance and coreloss characteristic, regulation and heat runs, the synchronous motor and generator: amplitude and phase displacement of the various phases of multiphase machines, no load and load saturation, phase characteristics, pulsation, regulation and compounding curves, starting test, etc., the induction motor: determination and plotting of curves for power factor, speed, slip, torque, efficiency as function of speed, starting tests on motors with squirrel cage armatures and compensator, also on machines with variable rotor resistance, impedance and coreloss curves and maximum output determination, the single phase induction motor, etc.

**Alternating Current Machine Design.** This subject is a continuation throughout the Senior year of the Machine Design begun during the Junior year, and the two are handled in much the same manner. Transformers, induction motors, alternating current generators, etc., are calculated and their layouts completed. As each type of machine is taken up, fundamental lectures are first given, outlining the requirements for successful construction and operation and supplying data for all computations. Individual work is then assigned to each student and is carried out under the personal supervision of the instructor.

The foregoing courses cover the general theory of electrical phenomena and machinery. The application of this knowledge to the various fields of electrical engineering work is taken up in the following courses.

**Electric Lighting.** This covers methods of using electricity in the production of light, systems of distribution, their comparative economy and efficiency, central station layout and equipment, switchboard design, electricity meters, lightning protection, standard wiring, indoors and out-of-doors.

**Electric Transmission.** The subjects discussed here are long distance transmission, line construction, systems, grouping of machines, control of phase, methods of compensation, maximum power supplied over line, line efficiency, copper efficiency, distributed capacity, inductance, resistance, leakage and natural period of transmission line, surging, resonance due to higher harmonics, balanced and unbalanced poly-phase systems, transformations.

A part of this course, dealing with the more intricate problems, is given by Professor Steinmetz personally.

**Electric Railways.** The subject of electric railway engineering is treated in three sections: 1. From the point of view of the consulting engineer who, being retained by the promoters of a proposed railway, investigates the field and territory of the new line, advises as to probable earnings of line, lays out route, prepares plans and specifications and has charge of construction. 2. From the point of view of the operating engineers who have charge of rolling stock and maintenance of service on the line. This includes a complete discussion of the equipment of modern electric railways, the various systems in vogue, sub-station equipment and in general the operation of electric railways. 3. The problem of the electric railway as it is presented to the designing electrical engineer is discussed. About half of the time devoted to railways is reserved for this section of the work. The questions of predetermination of railway motors from service characteristics, of train resistance and other quantities affecting the operation of electric trains are treated and the various alternating current railway motors which are being developed are discussed. The experimental railroad operated by the General Electric Company in Schenectady is a valuable auxiliary in this course.

**Electrochemistry.** This course has been given every second year to both Juniors and Seniors, under the direction of the Electro-chemical Research Laboratory of the General Electric Company. It includes the theory of solutions, osmotic pres-

sure, dissociation, concentrations and an outline of the principles underlying the many electrochemical processes of commerce.

An effort is now being made, however, to arrange for this course, by co-operation with the Department of Chemistry, so that it may be offered each year. Provision for laboratory practice is also under consideration.

**Scientific Literature and Technical Periodicals.** For the engineer ordinarily to neglect technical literature of the day is to live in the past. In this course, students are required to report in class upon certain English, German, French or American publications assigned to them, reviewing briefly the best articles found in current numbers. There are also included library references to biographical sketches and research works of eminent men.

It is intended by this means that the student shall become broadly familiar with the sources of the best and the most recent technical literature; that he shall learn how to keep abreast of the times; that he shall acquaint himself with channels through which he may obtain information upon any particular subjects; that he shall be able to summarize any article he reads, picking out its salient points; that he shall receive practice in expressing his thoughts clearly and concisely upon important subjects.

**Seminar.** Beginning with the Junior year one hour per week is given in mathematical seminar. Practical engineering problems are proposed, in the solution of which it is necessary to utilize the field of mathematics previously covered. Mechanics, thermodynamics, hydraulics, electrical phenomena of permanent or transient form—all combine to make an inexhaustible field from which graded problems are selected. This is the practical application of Algebra, Trigonometry, Calculus, etc.

The Senior year continues these exercises with problems constantly increasing in difficulty.

**Lectures by Engineers.** To Juniors and Seniors of this course is available the notable privilege of becoming, upon the payment of a nominal fee, members of the Schenectady Section of the American Institute of Electrical Engineers. Throughout the season of 1906-1907 occurred, before this Section, a succession of lectures probably without an equal except before the national body itself. The value of this course cannot be overestimated.

A partial list of the speakers of the past season is added:

T. C. MARTIN	PROF. C. P. STEINMETZ
E. G. ACHESON	V. G. CONVERSE
R. W. RAYMOND	E. J. BERG
J. B. TAYLOR	MAXWELL DAY
S. A. MOSS	H. B. EMERSON
PROF. W. S. FRANKLIN.	W. B. POTTER
F. O. BLACKWELL	C. W. STONE
W. S. ANDREWS	W. S. MOODY
PROF. ELIHU THOMSON	D. B. RUSHMORE
G. H. HILL	K. A. PAULY
S. D. SPRONG	E. E. F. CREIGHTON
RICHARD FLEMING	C. W. LARSON

### Electrical Laboratory Equipment

The new Electrical Engineering Laboratory is now in use. It is a commodious, well-lighted building, and permits the arrangement and grouping of the machines in a flexible relation to each other.

The ground plan of the building is T-shaped. The upper bar of the T has two stories. The lower floor is devoted to three laboratory rooms, the largest of which is 101 ft. by 35 ft. outside dimensions. This is the main laboratory and extends from front to rear of the building.

A light well-ventilated drafting room occupies the major portion of the second floor, being 73 ft. by 27 ft. in dimensions.



The purpose of a college laboratory of Electrical Engineering is two-fold: To familiarize the student with the shape, appearance, relative proportions and construction of modern electrical apparatus, and to instruct him in the handling, assembling, testing and operation of electrical apparatus under normal and abnormal conditions.

Because of the great variety and large size of modern electrical apparatus, the former purpose can be fulfilled very incompletely only, even in the largest and best equipped college laboratories. Through the favorable disposition of the General Electric Company, by giving the Electrical Engineering students of Union College free access to the works and testing rooms, this purpose is admirably fulfilled here, and by frequent and regular inspection trips to the Works and Testing Department of the General Electric Company under the direction of the college instructors, which trips constitute an integral part of the laboratory instruction, the students gain a very intimate knowledge of modern electrical apparatus of all types and sizes, not only when assembled and in operation and test, but also during their construction in the shops.

In equipping the college laboratory special consideration was therefore given to the selection only of such representative types of apparatus as can be handled, operated and tested by the students, and are of a size sufficiently large to correspond to modern practice, but not so large as to make the operation under abnormal conditions—that is, under conditions which as a rule are specially instructive—unsafe for the apparatus. All such machinery as the student can not be permitted to handle freely was excluded from the equipment.

Three sources of power are provided: A direct connected unit, consisting of a Westinghouse gas engine and a Westinghouse direct current generator; connection with the 500-volt trolley circuit of the Schenectady Railway Company; and connection with the primary three-phase distributing mains of the 2,300-volt alternating current city circuit. In the latter case the voltage is reduced by banks of step-down

transformers, so that the students can handle the safe low tension circuits only.

A secondary supply is also secured by means of a group of lead plate storage batteries charged by a mercury arc rectifier upon the alternating current power circuit.

A very large number of various sizes of transformers are provided to give the students practical experience in connecting transformers for different ratios and for transformation between three-phase, quarter-phase, six-phase, etc., systems. The equipment further contains three-phase, quarter-phase and six-phase alternators and synchronous motors, the two characteristic types of induction motors, three and six-phase rotary converters, bipolar and multipolar generators, and numerous smaller induction motors, converters and direct current motors and generators of different types. A constant current arc machine, with different types of arc lamps and a constant alternating current transformer, with series arc lamps, testing tables, switchboards and numerous instruments of the indicating and the integrating type, are also provided for efficient instruction.

Power is distributed from a central switchboard to the various boards in the laboratories; to the mechanical workshop provided for the students; and to the general lighting circuit of the building. Further additions to the laboratory are under contemplation.

### **Graduate Course—One Year**

#### **Leading to the Degree of M. E. E.**

To those students who, after graduating from the four-year Electrical Engineering course, desire to increase their knowledge a Graduate course is offered in which, besides instruction in higher branches of Electrical Engineering, there will be occasion to carry out original investigations under the supervision and with the assistance of specialists prominent in Electrical Engineering practice on subjects closely connected with the most recent advance of Electrical Engineering. In return for the assistance offered to the Grad-



uate students in their research work by prominent specialists the Graduate students will be required to devote a small part of their time to assisting the regular University instructors in laboratory instruction. This course leads to the degree of Master of Electrical Engineering, and is open to graduates of Union College or of other institutions approved by the Faculty.

Some of the courses offered to the graduate students are:

Advanced Calculus

Differential Equations

Long Distance Transmission

Design and Control of Electric Power Systems of Very Great Magnitude

Electric Railway and Traction, continued

Modern Theory of Electrical Engineering, continued

Oscillating Currents and High Frequency Phenomena

Transient Phenomena

Lightning and Lightning Protection

Wave Transmission, with Special Application to Telephony

Scientific Foundations of Electrical Engineering

Electro-Chemistry

Chemistry of Very High Temperature

Laboratory

Research Work

Some of the lectures given by Professor Charles P. Steinmetz for Graduates are as follows:

Review: The Electric, Magnetic and Dielectric Circuit. Resistance, Inductance, Capacity and Wireless Telegraphy.

The Law of Electromagnetic Induction; Electric Apparatus and Machines.

The Characteristic Curves of Electrical Apparatus, Machines and Circuits, Magnetic Characteristic: Saturation and Excitation Curve. Load Characteristic: Regulation Curve, Field Characteristic, Compounding Curve. Phase Characteristic of Alternating Current Apparatus; Efficiency, No Load and Load Losses.

Commutating Machines: Direct Current Generators and Motors.

Synchronous Machines: Alterators and Synchronous Motors and Converters.

Induction Machines: Induction Motors and Generators, Single Phase and Polyphase Repulsion Motors and Generators,

Rectifying Machines: The Arc Machine, Constant Potential and Constant Current Rectification, Arc Rectifiers, and Electrolytic Rectifiers.

Transformers and Reactors: Constant Potential and Constant Current.

Meters. Indicating, Integrating and Recording.

Transient Phenomena: Starting and Building Up of Direct Current Generators; Effect of Field Inductance and Fluctuating Load. Starting of Synchronous Machines.

Starting of Transformers, of Inductive Circuits, of Circuits containing Inductance and Capacity, Transmission Lines, Short Circuit Phenomena of Circuits containing Inductance and Capacity. Transmission Lines, Short Circuit Oscillations.

Short Circuit Current of Direct and Alternating Current Generators.

Hunting or Surging of Synchronous Machines, Motors and Converters. Hunting or Surging of Induction Machines, of Direct Current Motors and Generators.

In addition to this a course is given on the design of electrical apparatus, in which the students carry out the design

of a number of typical machines and apparatus under the personal direction of Professor Steinmetz; and the course includes the discussion of all the elements entering into the practical design and construction.

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Correspondence regarding admission to the undergraduate courses should be addressed to the Secretary of the Faculty. Correspondence regarding admission to the graduate course in Electrical Engineering may be addressed to

CHARLES P. STEINMETZ  
Professor of Electrical Engineering  
Schenectady, New York

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## GENERAL ENGINEERING

	First Term	Second Term	Third Term
<b>Freshman Year<sup>2</sup></b>	3 French 3 German 2 Rhetoric 3 Freehand Drawing 4 Algebra 1 Physiology  Lectures	3 French 3 German 2 Rhetoric  4 Analytic Ge- ometry 2 Mensuration 3 Mechanical Drawing 1 Gymnastics  Lectures	3 French 3 German 2 Rhetoric 2 Calculus 3 Analytic Ge- ometry 2 Surveying and Plotting 1 Trigonometry Summer Vaca- tion Work 1 Physiology
<b>Sophomore Year<sup>2</sup></b>	1 Rhetoric 3 Calculus 3 Mechanics 3 Physics 3 Chemistry 3 English Liter- ature 2 Surveying and Plotting 1 Hygiene	1 Rhetoric 3 Calculus 2 Mechanics 4 Physics 3 Chemistry 2 English Liter- ature 3 Descriptive Geometry 1 Electrical Laboratory	1 Rhetoric 2 Calculus 1 Mechanics 4 Physics 5 Chemistry 3 Topographical Surveying 3 Descriptive Geometry Shades and Shadows 1 Electrical Laboratory Summer Vaca- tion Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>Identical in General, Sanitary and Electrical Engineering courses.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

GENERAL ENGINEERING, OPTION A

	First Term	Second Term	Third Term
Junior Year <sup>2</sup>	1 Rhetoric 2 American History 4 Applied Mechanics 3 Chemical Laboratory 3 Highways and Pavements 5 Topographical Surveying	1 Rhetoric 2 American History 5 Mechanics of Materials and Eng. Laboratory 3 Kinematics Machine Drawing 3 Electricity 2 Thermodynamics 1 Natural Perspective	1 Rhetoric 2 American History 4 Stresses in Structures and Graph. Analysis 3 Hydraulics 3 Route Surveying 3 Spher. Trigonometry and Astronomy 2 Stereotomy Inspection Trips Summer Vacation Work
Senior Year	3 Economics 5 Railroad and Trolley Road Construction 4 Engineering Stresses 2 Economic Geology 2 Motors and Motive Power 2 Outlines of Architecture One Literary Essay One Technical Essay Inspection Trips	3 Sanitary Biology 3 Method of Least Squares 4 Engineering Design and Construction 2 Water Supply Engineering 3 Motors and Motive Power 2 Building Construction One Literary Essay One Technical Essay	3 Engineering Law and Procedure 3 Geodesy and Field Astronomy 5 Engineering Design and Construction 5 Water Supply Sewerage and Sewage Disposal Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>The Junior Year is identical in General and Sanitary Engineering courses.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## GENERAL ENGINEERING, OPTION B

	First Term	Second Term	Third Term
Junior Year	1 Rhetoric 2 American History 2 English History 1 Elements of Law 4 Applied Mechanics 3 Highways and Pavements 3 Chemical Laboratory 2 Topographical Surveying	1 Rhetoric 2 American History 2 English History 2 Elements of Law 5 Mechanics of Materials and Eng. Laboratory 3 Electrical Machinery 2 Thermodynamics	1 Rhetoric 2 American History 2 French History 3 Law of Property and Contracts 4 Stresses in Structures and Graph. Analysis 3 Route Surveying 3 Hydraulics Inspection Trips Summer Vacation Work
Senior Year	3 Economics 2 Political Science 3 Principles and Law of Corporations 2 Motors and Motive Power 4 Engineering Stresses 2 Outlines of Architecture 2 Economic Geology One Literary Essay One Technical Essay Inspection Trips	3 Sociology 2 Political Science 2 Principles of Finance and Financial Operations 3 Motors and Motive Power 4 Engineering Design and Construction 2 Water Supply Engineering 2 Building Construction One Literary Essay One Technical Essay	3 Sociology 2 International Law 3 Principles of Administration 5 Engineering Design and Construction 3 Principles of Accounting Thesis

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## SANITARY ENGINEERING

[The Freshman, Sophomore and Junior years of this course are identical with those years in the General Engineering Course following "Option A."]

## SENIOR YEAR

First Term	Second Term	Third Term
2 Motors and Motive Power	3 Motors and Motive Power	3 Engineering Law and Procedure
4 Engineering Stresses	4 Engineering Design and Construction	5 Engineering Design and Construction
3 Heating and Ventilation	2 Water Supply Engineering	5 Sewerage Sewage Disposal
3 Chemical Laboratory	2 Chemical Laboratory	1 House Draining and Plumbing
2 Economic Geology	3 Sanitary Biology	1 Sanitary Codes and Laws
3 Economics	3 Electives <sup>2</sup>	2 Electives <sup>2</sup>
One Literary Essay	One Literary Essay	Thesis
One Technical Essay	One Technical Essay	
Inspection Trips	Inspection Trips	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

<sup>2</sup>For list of electives, see page 109.



CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## ELECTRICAL ENGINEERING

For the general plan of course, see page 160.

Freshman and Sophomore Years as in General Course, page 174.

## JUNIOR YEAR

First Term	Second Term	Third Term
1 Rhetoric	1 Rhetoric	1 Rhetoric
1 Seminar	1 Seminar	1 Seminar
2 American History	2 American History	2 American History
2 Direct Current Laboratory	2 Electrical Laboratory	2 Electrical Laboratory
1 Mathematics	1 Mathematics	1 Mathematics
3 Direct Current Circuit and Apparatus	3 Direct Current Circuit and Apparatus	2 Elect. Apparatus Design
3 Hydraulics and Hydraulic Design	2 Hydraulic Turbine	2 Elements of Civil Engineering
4 Applied Mechanics	3 Theory of Steam Engine	2 Steam Engine Design
	3 Altern. Cur. Circuits and Apparatus	3 Altern. Cir. Circuits and Apparatus
3 Analytic Chemistry	1 Natural Perspective	3 Electric Lighting Summer Vacation Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

CURRICULUM OF THE B. E. COURSE<sup>1</sup>

## ELECTRICAL ENGINEERING

For the general plan of the course, see page 160.

Freshman and Sophomore Years as in General Course, see page 174.

## SENIOR YEAR

First Term	Second Term	Third Term
3 Economics	2 Electro-Chem.	3 Engineering
2 Electrical	2 Electrical	Law and Pro-
Laboratory	Laboratory	cedure
2 Electrical	2 Electrical	2 Electrical
Engineering,	Engineering	Engineering
Theory	Theory	Theory
3 Transmission	3 Transmission	3 Transmission
and Distribu-	and Distribu-	and Distribu-
tion	tion	tion
2 Elect. Appa-	3 Elect. Appa-	3 Elect. Appa-
ratus Design	ratus Design	ratus Design
1 Tech. Litera-	1 Tech. Litera-	1 Tech. Litera-
ture	ture	ture
1 Seminar	1 Seminar	1 Seminar
3 Thermodyn.	2 Electrical	2 Electrical
Gas Eng. and	Engineering	Engineering
Steam Turb.	Practice	Practice
3 Altern. Cur.	2 Electric	2 Electric
Circuits and	Railway	Railway
Apparatus	3 Altern. Cur.	5 Thesis
1 Thesis	Circuits and	
One Literary	Apparatus	
Essay	1 Thesis	
One Technical	One Literary	
Essay	Essay	
	One Technical	
	Essay	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject.

CURRICULUM OF THE SIX-YEAR B. E.-PH. B. COURSE<sup>1</sup>

## GENERAL ENGINEERING

Entrance requirements to be the same as for present Engineering Course and Latin-Scientific Course

First Year			Second Year		
4 <i>Fr</i> Latin <i>ls</i>	4 <i>Fr</i> Latin <i>ls</i>	4 <i>Fr</i> Latin <i>ls</i>	3 <i>So</i> Latin <i>ls</i>	3 <i>So</i> Latin <i>ls</i>	3 <i>So</i> Latin <i>ls</i>
3 <i>Fr</i> French or German <sup>2</sup> <i>ls</i> & <i>e</i>	3 <i>Fr</i> French or German <sup>2</sup> <i>ls</i> & <i>e</i>	3 <i>Fr</i> French or German <sup>2</sup> <i>ls</i> & <i>e</i>	3 <i>Fr</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i>	3 <i>Fr</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i>	3 <i>Fr</i> German or French <sup>2</sup> <i>ls</i> & <i>e</i>
2 <i>Fr</i> Rhetoric <i>ls</i> & <i>e</i>	2 <i>Fr</i> Rhetoric <i>ls</i> & <i>e</i>	2 <i>Fr</i> Rhetoric <i>ls</i> & <i>e</i>	3 <i>So</i> English & Rhet. <i>ls</i>	3 <i>So</i> English & Rhet. <i>ls</i>	3 <i>So</i> English & Rhet. <i>ls</i>
4 <i>Fr</i> Algebra <i>e</i>	4 <i>Fr</i> Anal. Geom. <i>e</i>	2 <i>Fr</i> Anal. Geom. <i>e</i>	3 <i>So</i> Calculus <i>e</i>	2 <i>So</i> Calculus <i>e</i>	2 <i>So</i> Calculus <i>e</i>
3 <i>Fr</i> Free Hand Drawing <i>e</i>	2 <i>Fr</i> Mensuration <i>e</i>	3 <i>Fr</i> Calculus <i>e</i>	3 <i>So</i> Chemistry <i>e</i>	5 <i>So</i> Chemistry <i>e</i>	5 <i>So</i> Chemistry <i>e</i>
1 <i>Fr</i> Physiology Lectures <i>ls</i> & <i>e</i>	1 <i>Fr</i> Physiology <i>ls</i>	1 <i>Fr</i> Physiology <i>ls</i> & <i>e</i>	3 <i>Fr</i> Mechanical Drawing <i>e</i>	1 <i>Fr</i> Trigonometry <i>e</i>	1 <i>Fr</i> Trigonometry <i>e</i>
	1 <i>Fr</i> Gymnasium Lectures <i>ls</i> & <i>e</i>	2 <i>Fr</i> Surveying <i>e</i>		Summer Vacation Work	Summer Vacation Work

First Term	Second Term	Third Term
3 So German or French <sup>2</sup> <i>ls</i> & <i>e</i> 3 So Physics <i>e</i> 3 Jr English & Rhet. <i>ls</i> 3 Jr Chem. Lab'y <i>e</i> 2 So English Hist. <i>ls</i> 3 So Mechanics <i>e</i>	3 So German or French <sup>2</sup> <i>ls</i> & <i>e</i> 4 So Physics <i>e</i> 3 Jr English & Rhet. <i>ls</i> 3 So Descrip. Geom. <i>e</i> 2 So English Hist. <i>ls</i> 2 So Mechanics <i>e</i>	3 So German or French <sup>2</sup> <i>ls</i> & <i>e</i> 4 So Physics <i>e</i> 3 Jr English & Rhet. <i>ls</i> 3 So Descrip. Geom. <i>e</i> 2 So French Hist. <i>ls</i> 1 So Mechanics <i>e</i> 3 So Topog. Surv. <i>e</i> Summer Vacation Work
4 Jr App. Mechanics <i>e</i> 5 Jr Topog. Surv. <i>e</i> 3 Jr Logic <i>ls</i> 3 Jr American Hist. <sup>3</sup> <i>ls</i> 3 Jr Biology <i>ls</i>	5 Jr Mechs. of Mat. and Eng. Lab'y <i>e</i> 2 Jr Thermodyn's <i>e</i> 3 Jr Psychology <i>ls</i> 3 Jr American Hist. <i>ls</i> 3 Jr Biology <i>ls</i> 1 Jr Nat. Perspec. <i>e</i> 1 So Elec. Lab'y <i>e</i>	4 Jr Stresses <i>e</i> 3 Jr Hydraulics <i>e</i> 3 Jr Ethics <i>ls</i> 3 Jr American Hist. <i>ls</i> 3 Jr Biology <i>ls</i> 1 So Elec. Lab'y <i>e</i> Summer Vacation Work

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. *Fr.*—Freshman work, *So.*—Sophomore work, *Jr.*—Junior work; *ls* shows that the work is taken from the regular four-year Ph. B. course; *e* that the work is taken from the regular four-year B. E. course.

<sup>2</sup>Students offering French at entrance will take French during the first year and German during the second and third years; but students offering German at entrance will take German during the first and second years and French during the third year.

<sup>3</sup>Subjects preceded by *E* are taken from the elective list, but are required in this course

After the completion of the fourth year, students in this course are given the choice of two optional courses A and B. The details of these optional courses are here given.

## CURRICULUM OF THE SIX-YEAR B. E.-PH. B. COURSE<sup>1</sup>

### GENERAL ENGINEERING, OPTION A

First Term			Second Term			Third Term					
3	ESr	European Hist. <sup>2</sup>	ls	3	ESr	European Hist. <sup>2</sup>	ls	3	ESr	European Hist. <sup>2</sup>	ls
2	ESr	Comparative Politics <sup>2</sup>	ls	2	ESr	Comparative Politics <sup>2</sup>	ls	2	ESr	Internat. Law <sup>2</sup>	ls
3	Sr	Economics	ls & e	3	Sr	Sociology	ls	3	Sr	Sociology	ls
4	Sr	Stresses	e	3	Jr	Kinematics and Machine Draw.	e	3	Jr	Route Surv.	e
2	Sr	Motors and Motive Power	e	3	Sr	Motors and Motive Power	e	3	Jr	Spher. Trigon. and Astronomy	e
1	Sr	Rhetoric	ls	1	Sr	Rhetoric	e	1	Sr	Rhetoric	ls
3	EJr	Gen. Geology	ls	3	Jr	Elect. Machinery	e	2	Jr	Stereotomy	e
								Summer Vacation Work			
6	Sr	R. R. & Trolley Const'n & Econ.	e	4	Sr	Eng. Design	e	5	Sr	Eng. Design	e
2	Sr	Outlines of Architecture	e	2	Sr	Water Supply	e	5	Sr	Water Supply and Sewerage	e
3	Sr	Principles of Architect. Design	e	2	Jr	Build. Const'n	e	3	Jr	Law of Prop. and Contracts	e
1	Jr	Elements of Law	e	3	Sr	Least Squares	e	3	Sr	Geodesy and Field Astron.	e
2	Sr	Econ. Geology	e	3	Sr	Bacteriology	e	Thesis			
3	Jr	Highways and Pavements	e								

Fifth Year			Sixth Year		
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<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. *Jr.*—Junior work, *Sr.*—Senior work; *ls.* shows that the work is taken from the regular four-year Ph. B. course; *e* that the work is taken from the regular four-year B. E. course.

<sup>2</sup>Subjects preceded by *E* are taken from the elective list, but are required in this course.

# CURRICULUM OF THE SIX-YEAR B. E.-PH. B. COURSE<sup>1</sup>

GENERAL ENGINEERING, OPTION B

First Term		Second Term		Third Term	
<p>3 <i>ESr</i> European Hist.<sup>2</sup> <i>ls</i>                  2 <i>ESr</i> Comparative Politics<sup>2</sup> <i>ls</i>                      <i>ls</i> &amp; <i>e</i>                  3 <i>Sr</i> Economics <i>ls</i>                  1 <i>Sr</i> Rhetoric <i>ls</i>                  1 <i>Jr</i> Elements of Law <i>e</i>                  4 <i>Sr</i> Stresses <i>e</i>                  2 <i>Sr</i> Econ. Geology <i>e</i>                  2 <i>Sr</i> Motors and Motive Power <i>e</i></p>		<p>3 <i>ESr</i> European Hist.<sup>2</sup> <i>ls</i>                  2 <i>ESr</i> Comparative Politics<sup>2</sup> <i>ls</i>                      <i>ls</i>                  3 <i>Sr</i> Sociology <i>ls</i>                  1 <i>Sr</i> Rhetoric <i>ls</i>                  3 <i>Jr</i> Elements of Law <i>e</i>                  3 <i>Jr</i> Elec. Machinery <i>e</i>                  3 <i>Sr</i> Motors and Motive Power <i>e</i></p>		<p>3 <i>ESr</i> European Hist.<sup>2</sup> <i>ls</i>                  2 <i>ESr</i> Internat. Law<sup>2</sup> <i>ls</i>                  3 <i>Sr</i> Sociology <i>ls</i>                  1 <i>Sr</i> Rhetoric <i>ls</i>                  3 <i>Jr</i> Law of Prop. and Contracts <i>e</i>                  3 <i>Jr</i> Route Survey <i>e</i>                  2 <i>Jr</i> Stereotomy <i>e</i>                  Summer Vacation Work</p>	
<p>6 <i>Sr</i> R. R. &amp; Trolley Const'n &amp; Econ. <i>e</i>                  3 <i>Sr</i> Prin. of Law of Corporations <i>e</i>                  2 <i>Sr</i> Outlines of Architectur<sup>e</sup> <i>e</i>                  3 <i>Sr</i> Prin. of Aesthet Design <i>e</i>                  3 <i>Jr</i> Highways and Pavements <i>e</i></p>		<p>4 <i>Sr</i> Eng. Design <i>e</i>                  4 Eng. Projects                  2 <i>Sr</i> Prin. of Finance and Financial Operations <i>e</i>                  2 <i>Sr</i> Building Construction <i>e</i>                  2 <i>Sr</i> Water Supply <i>e</i>                  3 <i>Sr</i> Bacteriology <i>e</i></p>		<p>5 <i>Sr</i> Eng. Design <i>e</i>                  5 <i>Sr</i> Water Supply and Sewerage <i>e</i>                  3 <i>Sr</i> Principles of Accounting <i>e</i>                  3 <i>Sr</i> Principles of Administration <i>e</i>                  Thesis</p>	

<sup>1</sup>The figure at the left indicates the number of hours per week devoted to class work in the subject. *Jr.*—Junior work, *Sr.*—Senior work; *ls.* shows that the work is taken from the regular four-year Ph. B. course; *e* that the work is taken from the regular four-year B. E. course.

<sup>2</sup>Subjects preceded by *E* are taken from the elective list, but are required in this course.





ALBANY MEDICAL COLLEGE

ALBANY, NEW YORK

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MEDICAL DEPARTMENT OF

UNION UNIVERSITY

---

SEVENTY-SEVENTH SESSION

## ALBANY MEDICAL COLLEGE

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The Medical College building, situated on Eagle Street, Albany, is well appointed in its lecture rooms, laboratories, dissecting room and museums. The laboratories in chemistry and physiological chemistry are fitted with every requisite for the use of the classes and the illustration of the lectures, while the Bender Hygienic Laboratory furnishes unexcelled facilities for instruction in histology, pathology, bacteriology, experimental physiology and clinical microscopy.

The location of the college is such as to afford superior advantages to the student. The hospitals and dispensaries furnish an abundant supply of material for the illustration of clinical medicine and surgery, while the museums are especially rich in anatomical and pathological preparations.

The course of instruction is graded and extends over four years. The curriculum embraces lectures by professors and lecturers; recitations conducted mainly by instructors, and practical demonstrations, clinical teaching and laboratory work, in which the professors in the different departments are assisted by clinical assistants and demonstrators.

The Albany Hospital, St. Peter's Hospital, Child's Hospital, St. Margaret's House, Albany's Hospital for Incurables, County Hospital, South End Dispensary, Eye and Ear Infirmary, Albany Orphan Asylum, and dispensaries connected with each, are, by the regulation of their governing boards, made available for clinical purposes to the students, and appointments to positions on the house staffs of the Albany Hospital, and other hospitals in Albany and neighboring places, are annually made and are competed for by the members of the graduating class.

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MAYOR OF ALBANY

RECORDER OF ALBANY

} *Ex-Officio*

CATALOGUES are sent with care, and graduates of the college changing their post-office address, or not receiving them, will please notify

WILLIS G. TUCKER, M. D., *Registrar*

Albany Medical College

Albany, New York

**FACULTY**

---

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Chancellor ad interim of the University

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Professor of Surgery

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Emeritus Professor of Materia Medica, Therapeutics and Diseases of the Throat and Nose

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Professor of Obstetrics, Gynecology and Diseases of Children

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Professor of Materia Medica and Therapeutics, and Adjunct  
Professor of Theory and Practice of Medicine

JOSEPH DAVIS CRAIG, M. D.

Professor of Anatomy, and Curator of the Museum

WILLIS GOSS MACDONALD, M. D.

Professor of Abdominal and Clinical Surgery

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Professor of Pathology and Bacteriology

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Professor of Diseases of the Throat and Nose

LEO HAENDEL NEUMAN, M. D.

Professor of Gastro-Enteric Diseases, and Clinical Professor  
of Theory and Practice of Medicine

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### Clinical Professors

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JESSE MONTGOMERY MOSHER, M. D.

Insanity, Neurology and Electro-Therapeutics

HARRY JUDSON LIPES, M. D.

Obstetrics

EDGAR ALBERT VANDER VEER, M. D.

Surgery

ARTHUR WELLS ELTING, M. D.

Surgery and Lecturer on Surgical Pathology

JOHN ALBERTSON SAMPSON, M. D.

Gynecology

ARTHUR SAUTTER, M. D.

Dermatology and Lecturer on Genito-Urinary Diseases

GEORGE EMORY LOCHNER, M. D.

Gynecology

CLEMENT FRANK THEISEN, M. D.

Diseases of Throat and Nose

HENRY LARNED KEITH SHAW, M. D.

Diseases of Children

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Materia Medica

HOLMES CONDUCT JACKSON, PH. D.

Physiological Chemistry and Director of Laboratory

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History of Medicine

CHARLES HARPER RICHARDSON, M. D.

Surgical Technic

ARTHUR TURNER LAIRD, M. D.

Clinical Microscopy

CHARLES HENRY MOORE, M. D.

Ophthalmology and Otology

HERBERT DODGE PEASE, M. D.

Antitoxins and Immunity

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LA SALLE ARCHAMBAULT, M. D.

Neurology

GEORGE EVERETT BEILBY, M. D.

Histology



ARTHUR FENWICK HOLDING, M. D.

Radiography

WILLIAM ATWOOD LARKIN, PH. G.

Inorganic Chemistry and Instructor in Organic Chemistry

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**Instructors**

ALVAH HARRY TRAVER, M. D.

Surgery

EDGAR ROSCOE STILLMAN, M. D.

Physiology

EDWARD WATERBURY BECKER, M. D.

Physiology

HARRY WARDELL CAREY, M. D.

Physiology and Physiological Chemistry

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Ophthalmology

EDWARD GERALD GRIFFIN, M. D.

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Surgical Pathology

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Anatomy. Prosecutor of Anatomy

JOSEPH ALOYSIUS LANAHAN, M. D.

Dermatology

HARRY RULISON, M. D.

Clinical Microscopy

BRASEN KEEMPER DE VOE, M. D.

Anatomy

EUGENE EUNSON HINMAN, M. D.

Diseases of Throat and Nose

JOHN HENRY GUTMAN, M. D.

Surgery and Obstetrics

JAMES NEWELL VANDER VEER, M. D.

Genito-Urinary Surgery

MALCOLM DOUGLAS, M. D.

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Pathology and Bacteriology

HAROLD PAYNE SAWYER, M. D.

Pathology and Bacteriology

THEOBALD FREDERICK DOESCHER, M. D.

Pathology and Bacteriology

ERASTUS CORNING, M. D.

Theory and Practice

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Clinical Assistants

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LOUIS LEBRUN, M. D.

JAMES MANNING MOORE, M. D.

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JEROME MEYERS, M. D.

JOSEPH LEWIS BENDELL, M. D.

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TIFFANY LAWYER, M. D.

CHARLES SANFORD ALLEN, M. D.

MARCUS DENIS CRONIN, M. D.

LOUIS HERBERT GAUS, M. D.

JACOB HENRY LINDEN, M. D.

## CALENDAR 1908-1909

## 1908

Regular winter session begins.....Tuesday, September 22  
Thanksgiving vacation begins....Wednesday, November 25  
Lectures resumed .....Monday, November 30  
Christmas vacation begins.....Wednesday, December 23

## 1909

Lectures resumed.....Monday, January 4  
Commencement .....Tuesday, May 18

**PRELIMINARY EXAMINATION**—The preliminary examination of medical students is under the control of the Board of Regents of the University of the State of New York. Those contemplating the study of medicine should apply to the High School Department, University State of New York, Albany, by letter or otherwise, if information concerning this examination further than that given in the catalogue of the Medical College is desired. One of the examinations will be held in Albany, September 23-26, 1908.

**MID-WINTER WRITTEN EXAMINATIONS** in all the departments are held before the Christmas vacation. A printed schedule of these examinations is furnished the class.

## COURSE OF INSTRUCTION

The four-year graded course required of all candidates for the degree of Doctor of Medicine embraces the following subjects:

## First Year

1. **Anatomy**—three lectures; six hours osteology and dissection. 2. **Inorganic Chemistry**—two and a half lectures; four hours laboratory; one recitation. 3. **Organic Chemistry**—two lectures; one recitation. 4. **Physiology**—two lectures; one

recitation; two hours demonstration. 5. **Hygiene**—one lecture. 6. **Histology**—five hours laboratory; one recitation. 7. **Materia Medica**—three lectures; two recitations.

**Lectures** 13½; laboratory 9 hours; dissection and demonstrations 8 hours; recitations 6.

### Second Year

1. **Anatomy**—two lectures; six hours dissection and demonstration; two recitations. 2. **Anatomy and Pathology of Nervous System**—one lecture; two and a half hours laboratory. 3. **Organic and Physiological Chemistry and Toxicology**—two lectures; three hours laboratory; two recitations. 4. **Physiology**—two lectures; two hours laboratory; two recitations. 5. **Therapeutics**—one lecture; one-half recitation. 6. **Theory and Practice**—two and a half lectures; one-half recitation. 7. **Surgery**—one and a half demonstrations. 8. **Bacteriology and Pathology**—seven and a half hours laboratory.

**Lectures** 11; dissections and demonstrations 8½ hours; laboratory 12 hours; recitations 6.

### Third Year

1. **Theory and Practice**—four lectures; two recitations; one hour clinics. 2. **Clinical Microscopy**—two and a half hours laboratory. 3. **Therapeutics**—two lectures. 4. **Electro-therapeutics**—one lecture half the term. 5. **Obstetrics and Gynecology**—three lectures. 6. **Pediatrics**—one lecture; one recitation half the term. 7. **Neurology**—one lecture; one recitation half the term; one clinic. 8. **Surgery (pathology, operative, fractures, dislocations)**—five lectures; two and a half hours laboratory; two recitations; three hours clinics. 9. **Physical Diagnosis and Ophthalmology**—section work, two hours. 10. **Medical Jurisprudence**—one lecture half the term. 11. **X Rays**—one demonstration half the term. 12. **Obstetrical Histology and Pathology**—two and a half hours laboratory.

13. **History of Medicine**—one lecture half the term. 14. **Conference**—one medical.

**Lectures** 17½; laboratory 7½ hours; demonstrations ½ hour; conference 1; recitations 5; section work 2; clinics 5.

### Fourth Year

1. **Theory and Practice**—three lectures; one recitation; two and a half hours clinics. 2. **Neurology**—one lecture; one clinic. 3. **Gynecology**—one lecture. 4. **Obstetrics**—one lecture; one recitation. 5. **Surgery (including Orthopedics)**—three lectures; one recitation; three hours clinics. 6. **Specialties**—one recitation. 7. **Conferences**—one medical; one surgical. 8. **Clinical section work**—fourteen hours.

**Lectures** 9; recitations 4; conferences 2; clinics 6½; clinical section work 14 hours.

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The order of instruction for the ensuing session will be found in the catalogue of the Medical College, and may be obtained by application to the Registrar.

### Laboratories

**Practical Chemistry.** The chemical laboratory is well furnished, conveniently arranged and supplied with all necessary apparatus. The laboratory course is preceded, since although some knowledge of chemistry is highly desirable none is now required at entrance, by a series of lessons upon chemical nomenclature, notation and the essential principles of theoretical chemistry, including the laws of combination and valence, and these subjects are therefore more briefly treated in the regular lecture course. The practical laboratory work includes tests for those metals and acids, which, in combination, are important as constituents of medicinal compounds or as poisons, together with the separation of the chief groups, volumetric analysis, the examination of unknown substances

and toxicology. All chemical reactions are written upon the blackboard, discussed by the class, and entered upon their notes.

### Physiological Chemistry

Laboratory work in this subject consists in the isolation, preparation and identification by tests, of the various important proteids, fats and carbohydrates. The composition of the tissues and organs is next studied with special reference to their most important constituents; the chemistry of digestion, secretion and excretion then receives attention in relation to the several physiological processes involved. Finally there follows a thorough course in qualitative and quantitative urine analysis. The student is required to make careful and thorough notes of the actual experiments performed and also of the deductions to be drawn from them. The practical work is interspersed with lectures and recitations.

### Histology, Pathology, Bacteriology and Clinical Microscopy

Work in these departments is carried on in the Bender Hygienic Laboratory, on Lake Avenue, near the Albany Hospital.

This building was erected by the late Matthew W. Bender, of Albany, and is thoroughly equipped with the apparatus necessary for the study of histology, pathology, bacteriology and clinical microscopy. Practical work in these branches is obligatory upon all students, and abundant opportunity is furnished in the laboratory for acquiring a thorough knowledge of these important subjects. An electric lantern which is adapted to the projection of pictures and microscopic preparations as well as lantern slides is used to supplement the more practical methods of demonstration.

**Histology.** The work consists of explanatory talks covering the subject of the day's study, followed by practical exercises in the laboratory.



**Bacteriology.** The work consists of lectures followed by practical laboratory exercises. It is intended to render the student familiar with the underlying principles of bacteriology and their application to clinical medicine and surgery.

**Pathology.** The work consists of a short lecture on the subject under discussion for the day followed by practical exercises in pathological anatomy and histology. Besides this the students are instructed in the technique of making autopsies, and material from autopsies and surgical operations is demonstrated to them as available. Demonstrations in experimental pathology are introduced whenever possible.

**Clinical Microscopy.** The course consists of preliminary talks followed by practical work in the examination of blood, urine, sputum, fæces, stomach contents, exudates, etc.; and includes a short course in clinical bacteriology.

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In all these courses the student is taught independent methods of work and is required to keep a permanent record, illustrated by drawings, of all laboratory exercises.

A limited number of students who have shown proper aptitude are offered the opportunity to work along more advanced lines.

For the alumni of this school, and for physicians in the vicinity, this laboratory offers excellent facilities for the examination of urine, sputum, pathological specimens and blood. Information regarding such examinations may be obtained by communicating with Dr. Richard M. Pearce, Director.

### Practical Clinical Courses

In order to familiarize students with the practical work of their profession, and to bring them into closer personal contact with patients, the fourth year class is divided into sections of eight or ten men, and on four days in each week each man devotes several hours to the examination and per-

sonal observation, under the supervision of the instructors, of patients in the wards and out-patient departments of the various hospitals and dispensaries. In this clinical work especial attention is devoted to the complete examination of the blood, urine, sputum and stomach contents, as well as to the special examination of the eye, ear and other organs. Thus in the course of the school year the men in each section acquire practical knowledge and technical diagnostic dexterity in general medicine, general surgery, dermatology, neurology, insanity, otology, laryngology, ophthalmology, rhinology, diseases of children and infants, infant feeding, diseases of the rectum and genito-urinary tract, operative surgery, orthopedic surgery, operative obstetrics, electrotherapeutics and medical technic.

### FEES AND EXPENSES

Fees, excepting the final examination fee, are payable each year in advance, are not returnable, and are as follows:

#### First Year

Matriculation . . . . .	\$5 00	
Lecture Course . . . . .	100 00	
Chemical Laboratory . . . . .	10 00	
Histological Laboratory . . . . .	10 00	
Dissection (including material).....	5 00	
	<hr/>	\$130 00

#### Second Year

Matriculation . . . . .	\$5 00	
Dissection (including material).....	10 00	
Lecture Course . . . . .	100 00	
Bacteriological and Pathological Laboratory . . . . .	15 00	
Physiological Chemistry and Experimental Physiology . . . . .	15 00	
	<hr/>	145 00

## Third Year

Matriculation . . . . .	\$5 00	
Lecture Course . . . . .	100 00	
Clinical Microscopy, Surgical and Obstetrical Pathology . . . . .	15 00	
	<hr/>	\$120 00

## Fourth Year

Matriculation . . . . .	\$5 00	
Lecture Course . . . . .	100 00	
Final Examination . . . . .	25 00	
	<hr/>	130 00

In addition to the fees above stated, an annual charge of two dollars is made to members of the first, second and third year classes taking laboratory courses at the Bender Laboratory, for the use of microscopes and other apparatus. This fee is paid to the director at the laboratory, and after laboratory tickets have been issued by the registrar. For the laboratory work in physiological chemistry there is a fee of two dollars to cover use of apparatus and breakage payable to the director at the beginning of the session. There is also a fee of five dollars paid by members of the fourth year class to the Guild for the Care of the Sick for the course in practical obstetrics.

The payment of three hundred dollars in advance entitles to attendance upon four courses of lectures, exclusive of laboratory and other special fees above stated, and effects a saving of one hundred dollars on the cost of the four year course, *but this ticket must be taken out within thirty days from date of matriculation*. All other fees are payable strictly in advance except that the final examination fee may be paid at any time before the examinations begin. Graduates of the school may attend lectures and stated clinics without charge except for matriculation in case of prolonged attendance.

The cost of living in Albany is less than in most other cities of its size. The janitor of the college keeps a list of boarding houses at which good rooms and board can be obtained at from four to five dollars a week or upwards, and by clubbing together students can live comfortably at still lower rates. No estimate can well be made of cost of text-books and other personal expenses since these of necessity vary greatly in different cases.

## REQUIREMENTS FOR GRADUATION

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The candidate must be twenty-one years of age, and exhibit a certificate from a physician or surgeon, duly authorized by law to practice his profession, that he has studied medicine and surgery under his instruction during the period required by law in this state, and he must present evidence of having complied with the law concerning preliminary examination.

He must have attended not less than four regular courses of lectures of which the last shall have been at this college.

Students who have attended one or more courses of lectures at other recognized medical colleges may be admitted to advanced standing in this college if they submit proper evidence of such attendance and a precise statement of subjects included in "Examination Departments," as given in the Medical College Catalogue, in which satisfactory final examinations have been passed, and comply with the requirements stated under "Examination Rules." No credit will be given for work done elsewhere in fourth year departments.

He must be of good moral character.

He must maintain a satisfactory standing during his course and pass a satisfactory final examination in the several branches taught.

Regular and punctual attendance is required, and matriculation tickets are endorsed with attendance at the end of the term.

For catalogues or further information, address

WILLIS G. TUCKER, M. D., *Registrar*  
Albany, New York

ALBANY LAW SCHOOL

ALBANY, NEW YORK

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LAW DEPARTMENT

UNION UNIVERSITY

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FIFTY-EIGHTH YEAR

1908-1909

## ALBANY LAW SCHOOL

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This School is among the oldest institutions of the kind in the country, having been established in 1851, and its graduates number many of the most successful men in the profession. The school is and has been largely represented in the Executive, Judicial and Legislative departments of this and many other States, as well as of the federal government.

It became a part of Union University in 1873, and begins its fifty-eighth year as a law school with the present scholastic year. During its long and successful career it has, in common with other law schools, done much to demonstrate what was at one time doubtful, but is now accepted almost as an axiom, that a course at the law school is a well-nigh necessary prerequisite to a successful professional career. Its instructors have always been men of repute and standing, both for professional learning and personal character.

### Local Advantages

The local advantages of the city of Albany, as the seat of a professional school, can not be overrated. It is the capital of one of the leading States in the Union, whose legislature is in session here for the third part of the year, presenting opportunities not afforded by any other Law School in the State for observing the methods and procedure collectively of the executive, judicial and legislative departments of the State government. The knowledge thus obtained by the students at law, who are to complete their course and to enter the realm of public affairs, can not be overestimated.

It is easily accessible, remarkably healthful, and the scene of great business and professional activity. It is large enough to afford its inhabitants all the means of culture and recreation naturally to be looked for in a city, while it is not so large as to make the cost of living burdensome, even to persons of extremely limited means.



### **Facilities for Study**

The facilities afforded the students for reading and study are unsurpassed.

Besides the convenient and well chosen library of the school accessible to the students at all hours of the day and evening, the students have the privilege of using the State Law Library, the most extensive and best selected in the United States, consisting of 65,000 volumes or more.

With free access to these libraries the student may be relieved to a great extent from purchasing text-books.

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Books and Their Uses

---

### **Special Lecturers**

The list of special lecturers is a notable one, including the former Chief Judge and two Associate Judges of the Court of Appeals, a Justice of the Supreme Court and a former Supreme Court Justice.

### **Hubbard Chair of Legal Ethics**

The circulars of seventy of the leading Law Schools of the country show that only twenty of this number make the subject of Legal Ethics part of their curriculum. With two exceptions, those schools are either in the West or South. These facts led Gen. Thomas H. Hubbard, class of '60, to place at the disposal of the Board of Trustees the sum of \$10,000, the income to be applied to lectures upon this subject. The Board of Trustees decided to inaugurate the course at the opening of the school year of 1903. Gen. Hubbard,

the founder of the chair, delivered the opening lecture, and will be followed during the academic year 1907-8 by Judge William E. Werner of the Court of Appeals, Hon. Alton B. Parker, late Chief Judge of that Court, and others.

## ACADEMIC YEAR

The full academic course leading to the degree of LL. B. is two years, divided into two semesters each.

### Requirements for Admission to Junior Class

The full course of study consists of two scholastic years. Any student who has conformed to the requirements of the Regents as to general education, or satisfies the Faculty that he will so conform to such requirements within the year allowed by the Regents for that purpose, after commencing the study of law, may enter the Junior class, and upon completion of the two years' course and passing the required examinations will be graduated with the degree of LL. B.

College graduates will find this course well adapted to the requirements of the Court of Appeals, requiring them to study law two calendar years after graduation. They can enter the school upon presentation of their certificate of graduation, without examination, attend the full course of two years, of not less than eight months each, receive the degree of LL. B., and take the bar examination in June following their graduation from the school.

### Requirements for Admission to Senior Class

Any student not a college graduate who has completed two years of required legal study, after conforming to the requirements of the Regents as to general education, or any college graduate who has completed one year of such study after graduation, will be admitted to the Senior class without examination upon production of the Regents' certificates and certificate of Clerk of Court of Appeals, and will be admitted

to the privileges of the class but will not be received as a candidate for a degree.

Students who have attended a law school and satisfactorily completed the work of the Junior year will be allowed to enter as candidates for a Degree in the discretion of the Faculty.

The degree of LL. B. will be conferred only upon students who have completed the entire course of two years at a law school.

### Tuition

The fees for tuition are payable in advance as follows: For the full course of one year, tuition, \$110; matriculation fee, \$10; fee for certificate of attendance, diploma and expenses attendant upon commencement, \$10, or \$65 for the first semester and \$65 for the second. For the full course of two years upon conferring degree of LL. B., tuition, \$220, \$10 matriculation fee, fee for certificate of attendance, diploma and expenses attendant upon commencement, \$10, or \$65 for the first semester and \$55 for each semester thereafter, except the last, which will be \$65,

For catalogues or further information address

JNO. J. HUGHES, *Secretary*

Albany Law School

Albany, New York



DUDLEY OBSERVATORY

ALBANY, NEW YORK

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## THE DUDLEY OBSERVATORY

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The Dudley Observatory is located on Lake Avenue, in the southwestern part of Albany, to which site it was removed in 1893 from its former location in the northern part of Albany. It is devoted to original researches in astronomy, according to the purpose of its founders and successive patrons. Its contributions to science are represented in two volumes of "Annals," and in other published volumes and memoirs contained in the transactions of learned societies and astronomical journals. Its principal line of work at the present time is the determination of problems relating to the positions and motions of the stars and of the solar system as a whole. The staff consists of the director, four assistants and seven computers.

The instrumental equipment of the Observatory is designed for the purposes of exact measurement in line with its chosen work. In the tower of the main building is the Pruyn Equatorial, with object-glass twelve inches in diameter. This instrument is equipped both for visual and photographic use, and is of a high order of mechanical perfection. The Olcott Meridian Circle is located in a separate building, especially designed for securing the utmost equality in the temperature between the external air and that in the building itself. Its object-glass is eight inches in diameter. It was made by Pistor and Martins, of Berlin, and is regarded by astronomers as a masterpiece of accurate workmanship. This instrument has been employed for many years in obtaining the measurements necessary for the construction of the numerous and elaborate star catalogues which have issued from the Dudley Observatory.

In addition to these instruments, the Observatory is in possession of various small telescopes, clocks, chronographs and smaller apparatus.

The institution is supported by an endowment, chiefly contributed by Mrs. Blandina Dudley, the late Catharine W.

Bruce, and Hon. Frederic P. Olcott, as well as by appropriations which have been received from the National Academy of Sciences, and from current contributions of trustees and friends of the institution.

Since 1902, annual grants have been made to the Director of the observatory by the Carnegie Institution of Washington. These have been sufficient to provide for the entire force of assistants and computers now employed. In 1905, the Carnegie Institution made special provision for carrying on the star researches upon which the Observatory is engaged for a period of ten years. This includes an appropriation which enables the Observatory to send the Olcott Meridian Circle to the Southern Hemisphere for several years with an ample force of observers, in order to carry out an essential feature of its investigations. It is intended that the expedition shall be prepared to begin operations in the Southern Hemisphere in 1908.

The Dudley Observatory is not designed to give general instruction in Astronomy, though special students contemplating instruction in professional lines have been received from time to time under an arrangement of computing service to the Observatory.

The Observatory is opened to visitors on Tuesday evening of each week from 8 to 10 o'clock.

For further particulars apply to

LEWIS BOSS  
Director

ALBANY COLLEGE OF PHARMACY

ALBANY, NEW YORK

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DEPARTMENT OF PHARMACY OF

UNION UNIVERSITY

## ALBANY COLLEGE OF PHARMACY

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The Albany College of Pharmacy was created by act of the Board of Governors of Union University, June 21, 1881, and constitutes the **Department of Pharmacy of Union University**. It was incorporated as the "Albany College of Pharmacy" August 27, 1881.

The exercises of the college are held in the Albany Medical College building on Eagle street, distant but a block from the Capitol, and in the pharmaceutical laboratory on Maiden Lane. The lecture rooms and laboratories are well adapted to the needs of the college and furnish to the faculty excellent facilities for imparting instruction. The lectures are delivered in the chemical lecture room on the first floor, adjoining which is the large and well-fitted chemical laboratory where instruction is given to the classes in practical chemistry. The collections in the different departments are very complete and afford the instructors ample facilities for the illustration of the lectures.

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Calendar for 1908-1909

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1908

Introductory lecture, Monday, October 5.  
Election vacation, Monday and Tuesday, November 2 and 3.  
Thanksgiving vacation begins Wednesday, November 25.  
Lectures resumed Monday, November 30.  
Christmas vacation begins Monday, December 21.

1909

Lectures resumed Monday, January 4.  
Commencement Tuesday, April 12.

Entrance Requirements

All applicants for admission to regular standing in this college must be at least seventeen years of age and will be required to present a PHARMACY STUDENT CERTIFICATE issued by the New York State Education Department. The requirement for this certificate is the completion of the first year's course in a recognized high school or academy, or evidence of an equivalent education. Inquiries concerning this preliminary requirement may be addressed to the New York State Education Department, Albany, N. Y.

The Curriculum

of the college embraces:

**Chemistry**—Theoretical, General, Pharmaceutical and Analytical

**Botany**—Structural, Systematic and Analytical

**Materia Medica and Pharmacognosy**

**Pharmacy**—Theoretical and practical

**Microscopy**—Theoretical and practical in its relations to Pharmacy

**Pharmaceutical Mathematics, Physics**



### Requirements for Graduation

The diploma of this college confers the degree of GRADUATE IN PHARMACY (Ph. G.). Applicants for this degree must have had the required preliminary education, be of good moral character, have attended two full courses of lectures (which shall have included all laboratory practice) in this college, or the last course in this college and the first in some other registered college of pharmacy; have passed satisfactory examinations and paid all fees as hereafter stated.

### Fees for Tuition

#### EACH YEAR

Matriculation . . . . .	\$5 00
Tuition . . . . .	70 00

Students who have attended two full courses of lectures at this college may attend further courses without extra charge. Payment of fees for matriculation, and for laboratory, and recitation courses will, however, be required, should the courses be taken.

### Situations

Students desirous of obtaining employment while attending college will be assisted as far as possible in securing situations, but employment cannot be promised in advance, and places cannot be secured by correspondence. During the past year the faculty has had a much larger number of openings offered for graduates to lucrative positions than it has been able to fill. The demand on the part of employers for skilled assistants is steadily increasing, and a college diploma or license from an examining board is demanded by law of those who engage in the practice of pharmacy in most of the states and cities of the Union.

For separate catalogue giving more complete information address

THEODORE J. BRADLEY, PH. G., *Secretary*  
4 Lancaster Street  
Albany, New York

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# University Publications

## **Union University Quarterly**

Published at the college in the interests of the several departments and their alumni

## **Union University Catalogue**

Published annually by the college, containing University lists, complete catalogue of the college, and condensed catalogues of the other departments

## **Albany Law School Catalogue**

Published annually by the department

## **Catalogue of the Albany Medical College and College of Pharmacy**

Published annually by the departments

## **Albany Medical Annals**

Published monthly by the Medical College

## **The Concordiensis**

Published weekly by the students of the college

## **The Garnet**

Published annually by the Junior Class of the college

















UNIVERSITY OF ILLINOIS-URBANA



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